1988 DOD
STANDARDIZATION
AND
DATA MANAGEMENT CONFERENCE

SUPPORTING THE ACQUISITION PROCESS

AUGUST 22-24, 1988

THE BWI AIRPORT MARRIOTT HOTEL
LINTHICUM, MARYLAND

SPONSORED BY:
OFFICE OF THE ASSISTANT
SECRETARY OF DEFENSE
(PRODUCTION AND LOGISTICS)

PARTICIPANTS
PROGRAM MANAGERS
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QUALITY MANAGERS
DATA MANAGERS
STANDARDIZATION MANAGERS
SELECTED INDUSTRY ASSOCIATIONS
AND TECHNICAL SOCIETIES

FOREWORD

1988 DOD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

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This publication contains papers and synopses from the 1988 DoD Conference. Recommendations from each panel have been provided and are shown with their proposed action office assignment. Recommendations will be evaluated and appropriate action taken to implement or make other disposition.

These proceedings contain presentations made by numerous leaders and experts in the fields of acquisition, standardization, and data management, as well as many other related areas. The conference focused on current acquisition problems, provided a forum for program managers to exchange information and relate acquisition "success stories," and examined future acquisition policies. A number of recommendations were made by the Session Panels, and the Director, Standardization and Data Management will ensure that the appropriate DoD offices address these recommendations.

Credit for this conference's success goes to the panel chairmen and their panelists who gave generously of their time, effort, and talent, to the participants who kept the discussions lively and meaningful, and especially to the Office of the Assistant Secretary of the Air Force Acquisition which funded the Conference.

Questions or comments on the conference or these proceedings should be directed to Mr. Lee Rogers or Mrs. Shari Strickland of the Defense Standardization Program Office on 703-756-2340 or Autovon 289-2340.

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The 1988 DoD Standardization and Data Management Conference is the fourth in a series of bi-annual meetings convened to address timely issues affecting defense acquisition. Complementary goals are making the standardization and data management communities more responsive to the needs of program managers, and making the program managers more aware of the benefits of these programs to their weapons systems and the operational readiness of our military forces. The theme of the conference, "Supporting the Acquisition Process," recognizes the role standardization and data management have in improving the quality and reliability of defense materiel.

The participants were selected from defense contractors, non-Government standards bodies, industry associations, and DoD weapons systems program managers and their staffs, as well as from DoD's standardization and data management communities.

Keywords: Quality management, parts control, metrification. (KR)

TABLE OF CONTENTS

APPENDICES

1988 DoD Standardization and Data Management Conference
Supporting the Acquisition Process

Sunday August 21

5:00 - 8:00 Registration

Monday August 22

7:00 - 9:00 Breakfast for Conference attendee registered hotel guests only

7:30 - 10:00 Registration

8:00 - 9:30

Tutorial A
Standardization
Lee E. Rogers, P.E.
Asst for Standardization Mgmt
OASD(P&L)DSPO

Tutorial B
Configuration Management
Linda S. Burgher
Senior Staff Specialist
OASD(P&L)DDMO

10:00 - 11:30 **General Session**

Administrative Remarks - Andrew D. Certo, Director, Defense Standardization Program Office (DSPO)

Welcome Remarks - Peter Yurcisin, Conference Chairman, Director, Standardization and Data Management, OASD(P&L)SDM

General Session Panel - Andrew D. Certo, Moderator

Brent A. Hardesty, Director, Aerospace Management Systems, McDonnell Douglas Corp

Charles W. Clark, Associate Administrator for Procurement Policy, Office of Federal Procurement Policy

Col Craig E. Brodie, Director, Engineering Data Directorate, U.S. Army Tank-Automotive Command

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11:45 - 1:45 **Lunch and Keynote Speaker** -- Dr. Joseph F. Shea, Raytheon Co. Senior Vice President - Engineering

2:00 - 5:00**

Panel 1- Session A
Impact of the New Defense Acquisition Board Process
John E. Smith
Deputy Director, Acquisition Systems Management, OUSD(A)(PI/ASM)
Chairman

Panel 1-Session B
Metrication--Your Role Now!
Thomas E. Mansperger
Col, USAF, Chairman

5:00 - 6:30 **Reception (No host bar)**

6:30 - 7:30 **Banquet**

7:30 **Guest Speaker** -- Tom Clancy, Author of *"Hunt for Red October," "Red Storm Rising,"* and *"Patriot Games"*, and *"The Cardinal of the Kremlin"*

Tuesday August 23

7:00 - 8:15 — Breakfast for Conference attendee registered hotel guests only

8:30 - 11:30*

Panel 2-Session A
NDI-Is the DoD Really Serious
Gregory E. Saunders
Asst. for Commercial Acquisition
OASD (P&L) SDM, Chairman

Panel 2-Session B
Total Quality Management
Jack C. Strickland
Director, Industrial Productivity & Quality
OASD (P&L [illegible]), Chairman

11:45 - 1:45 — **Awards Luncheon** — Mr. Peter Yurcisin, Conference, Chairman

2:00 - 5:00**

Panel 3-Session A
Parts Control
Ronald A. Kunihiro
Senior Staff Engineer
OASD (P&L) DPSO, Chairman

Panel 3-Session B
Rights in Technical Data--
Issues and Controversies
Carl L. Berry
Director, Defense Data Mgmt. Office
OASD (P&L) DDMO
Bettie McCarthy
Washington Representative, Proprietary
Industries Association
Co-Chairs

Wednesday August 24

7:00 - 8:15 — Breakfast for Conference attendee registered hotel guests only

8:30 - 11:30*

Panel 4-Session A
International Standardization
(RSI)
Samuel P. Miller
Asst. for International Standardization
OASD (P&L) DPSO, Chairman

Panel 4-Session B
Streamlined Specifications--
Generation and Application
Frank E. Doherty
Asst. for Acquisition Streamlining
OASD(P&L)IPQ
Frederick (Tom) Stark
McDonnell-Douglas Corp.
Co-Chairmen

11:45 - 2:00 — **Wrap-up Luncheon** — Mr. Peter Yurcisin, Conference, Chairman

* Morning Breaks

Panel A	9:30 - 10:00
Panel B	9:45 - 10:15

** Afternoon Breaks

Panel A	3:00 - 3:30
Panel B	3:15 - 3:45

1988 DOD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

TUTORIAL A

STANDARDIZATION

LEE E. ROGERS, P.E.
ASSISTANT FOR STANDARDIZATION MANAGEMENT
OASD(P&L)DSPO

An overview of the Defense Standardization Program and its role in today's acquisition environment. This tutorial is not intended for DoD personnel who work in an office listed in the Standardization Directory, SD-1. Rather, it is for individuals who use specifications and standards and who would benefit from insight into policies and procedures governing them.

DEPARTMENT OF DEFENSE

DEFENSE STANDARDIZATION PROGRAM

DEFENSE STANDARDIZATION AND SPECIFICATION PROGRAM (DSSP) REQUIRED BY LAW

DEFENSE CATALOGING & STANDARDIZATION ACT
TITLE 10, U.S. CODE CHAPTER 145
SECTIONS 2451-2457

- DIRECTED DEVELOPMENT OF THE PROGRAM
- REQUIRES ACHIEVEMENT OF HIGHEST PRACTICABLE DEGREE OF STANDARDIZATION OF ITEMS & PRACTICES USED THROUGHOUT DOD

6-0823

STANDARDIZATION DEFINED

...IS THE ADOPTION AND USE (BY CONSENSUS OR DECISION) OF ENGINEERING CRITERIA APPLIED, AS APPROPRIATE, IN:

- DESIGN
- DEVELOPMENT
- PROCUREMENT
- PRODUCTION
- QUALITY ASSURANCE
- SUPPLY
- MAINTENANCE
- DISPOSAL OF EQUIPMENT AND SUPPLIES

THROUGH STANDARDS AND SPECIFICATIONS

7 22'6

DSSP OBJECTIVES

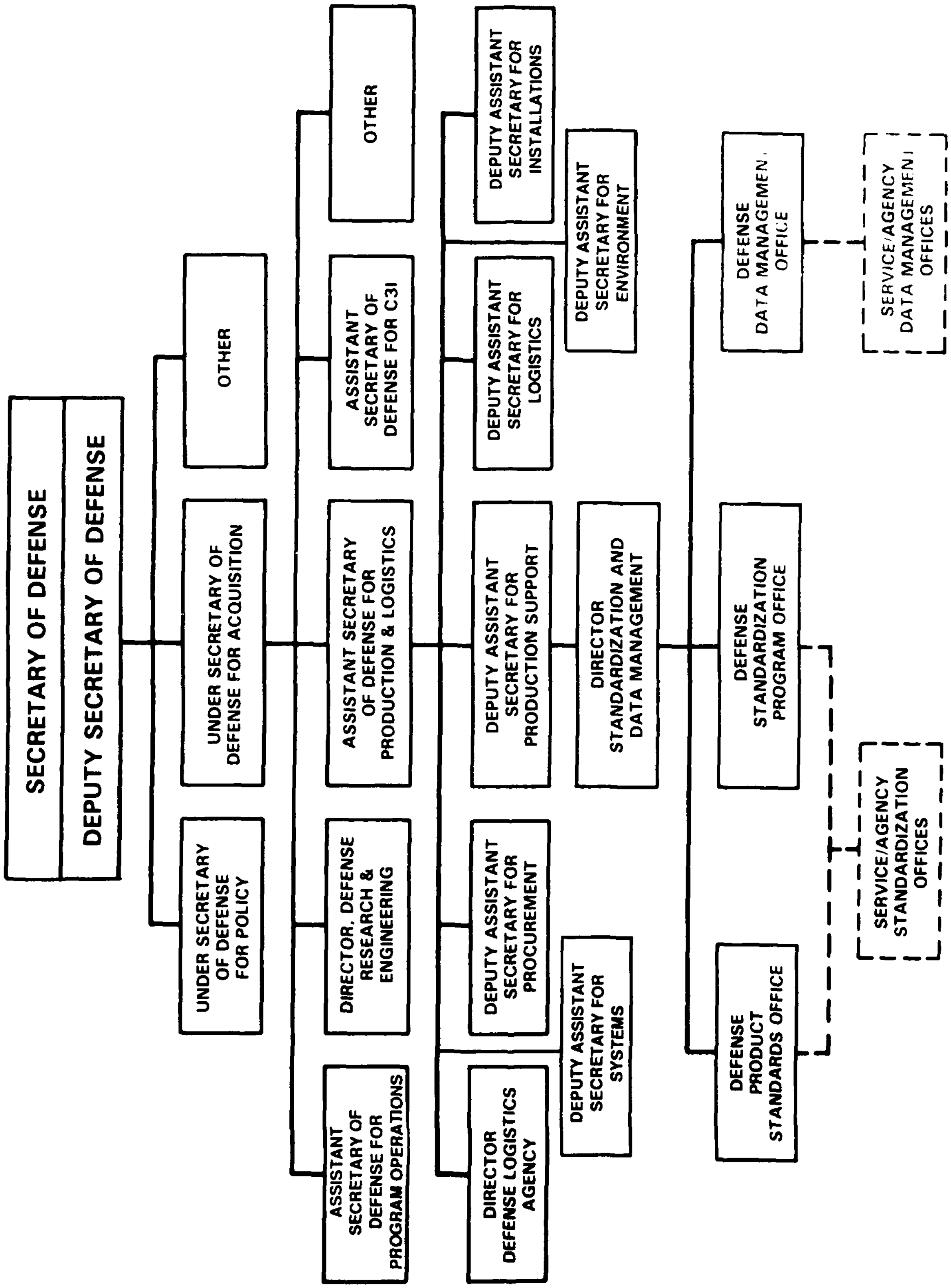
- IMPROVE OPERATIONAL READINESS OF MILITARY SERVICES
- MINIMIZE VARIETY OF ITEMS, PROCESSES, AND PRACTICES USED IN ACQUISITION AND LOGISTIC SUPPORT
- ENHANCE INTERCHANGEABILITY, RELIABILITY, AND MAINTAINABILITY OF MILITARY EQUIPMENTS AND SUPPLIES

7-0653

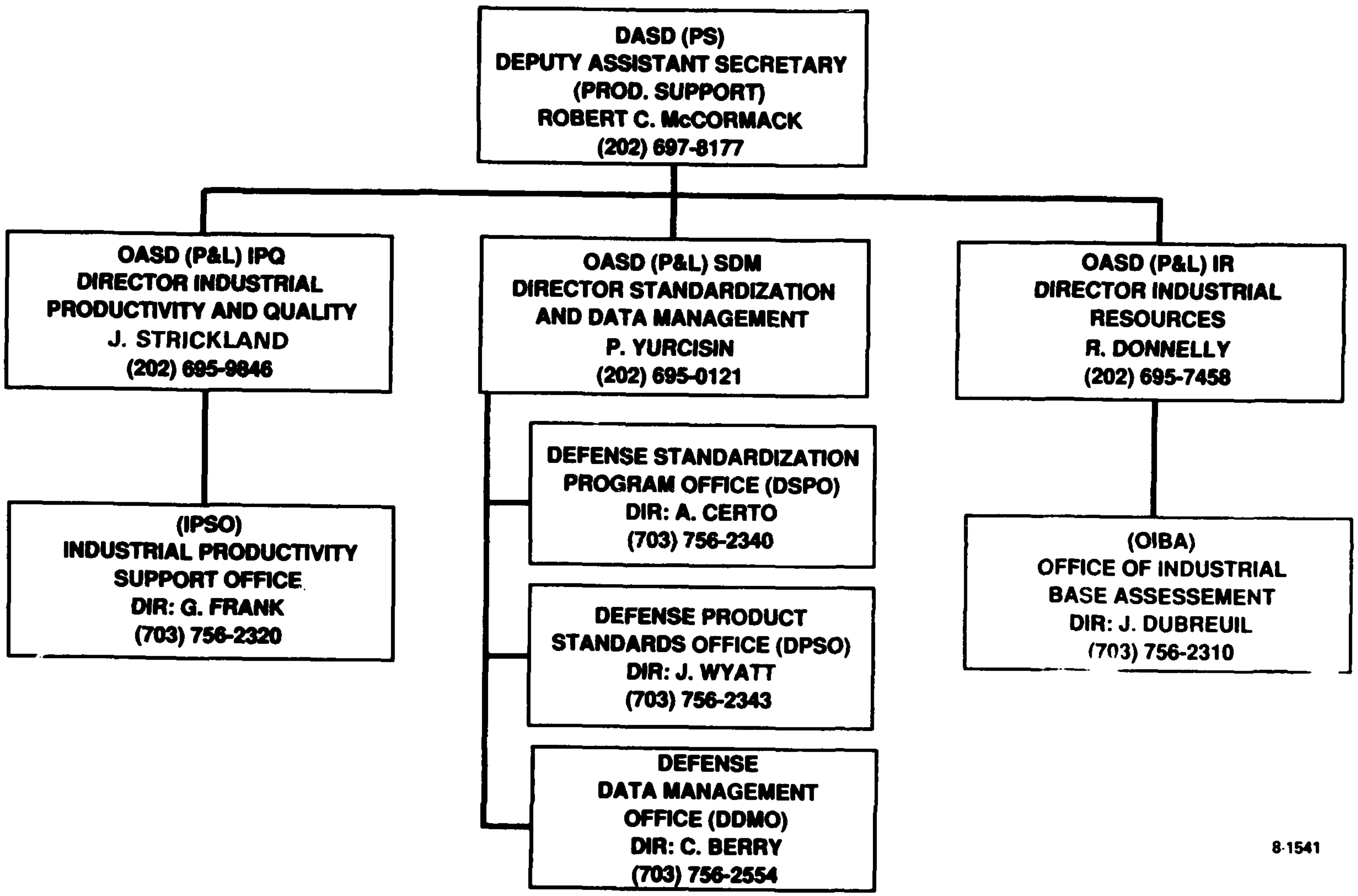
DSSP POLICIES AND PROCEDURES

- DODD 4120.3, DEFENSE STANDARDIZATION AND SPECIFICATION PROGRAM
- DOD 4120.3-M, DEFENSE STANDARDIZATION MANUAL
- ESTABLISH A SINGLE INTEGRATED DoD STANDARDIZATION PROGRAM
- CONTROLLED AND DIRECTED BY THE OFFICE OF THE SECRETARY OF DEFENSE

6-0323


SECRETARY OF DEFENSE
DEPUTY SECRETARY OF DEFENSE
UNDER SECRETARY OF DEFENSE FOR POLICY
UNDER SECRETARY OF DEFENSE FOR ACQUISITION
OTHER
ASSISTANT SECRETARY OF DEFENSE FOR PROGRAM OPERATIONS
DIRECTOR, DEFENSE RESEARCH & ENGINEERING
ASSISTANT SECRETARY OF DEFENSE FOR PRODUCTION & LOGISTICS
ASSISTANT SECRETARY OF DEFENSE FOR C3I
OTHER
DIRECTOR DEFENSE LOGISTICS AGENCY
DEPUTY ASSISTANT SECRETARY FOR SYSTEMS
DEPUTY ASSISTANT SECRETARY FOR PROCUREMENT
DEPUTY ASSISTANT SECRETARY FOR PRODUCTION SUPPORT
DEPUTY ASSISTANT SECRETARY FOR LOGISTICS
DEPUTY ASSISTANT SECRETARY FOR ENVIRONMENT
DEPUTY ASSISTANT SECRETARY FOR INSTALLATIONS
DIRECTOR STANDARDIZATION AND DATA MANAGEMENT
DEFENSE PRODUCT STANDARDS OFFICE
DEFENSE STANDARDIZATION PROGRAM OFFICE
DEFENSE DATA MANAGEMENT OFFICE
SERVICE/AGENCY STANDARDIZATION OFFICES
SERVICE/AGENCY DATA MANAGEMENT OFFICES

PRODUCTION SUPPORT ORGANIZATION



8-1541

ORGANIZATION

OASD (P&L) SDM
P. YURCISIN
AV 225-0121
(202) 695-0121

DSPO/DPSO/DDMO

TELEPHONES:
(703) 756 EXTENSION
AUTOVON 289 EXTENSION

DEFENSE STANDARDIZATION PROGRAM OFFICE
DIR: A. CERTO
EXT. 2340
(DSPO)

- DSSP POLICY
- AUTOMATION
- NON-GOVERNMENT STANDARDS
- NDI/COMMERCIAL ACQN
- DSC SECRETARIAT
- STDZN TRAINING
- ITEM REDUCTION STUDIES
- COST BENEFIT ANALYSIS

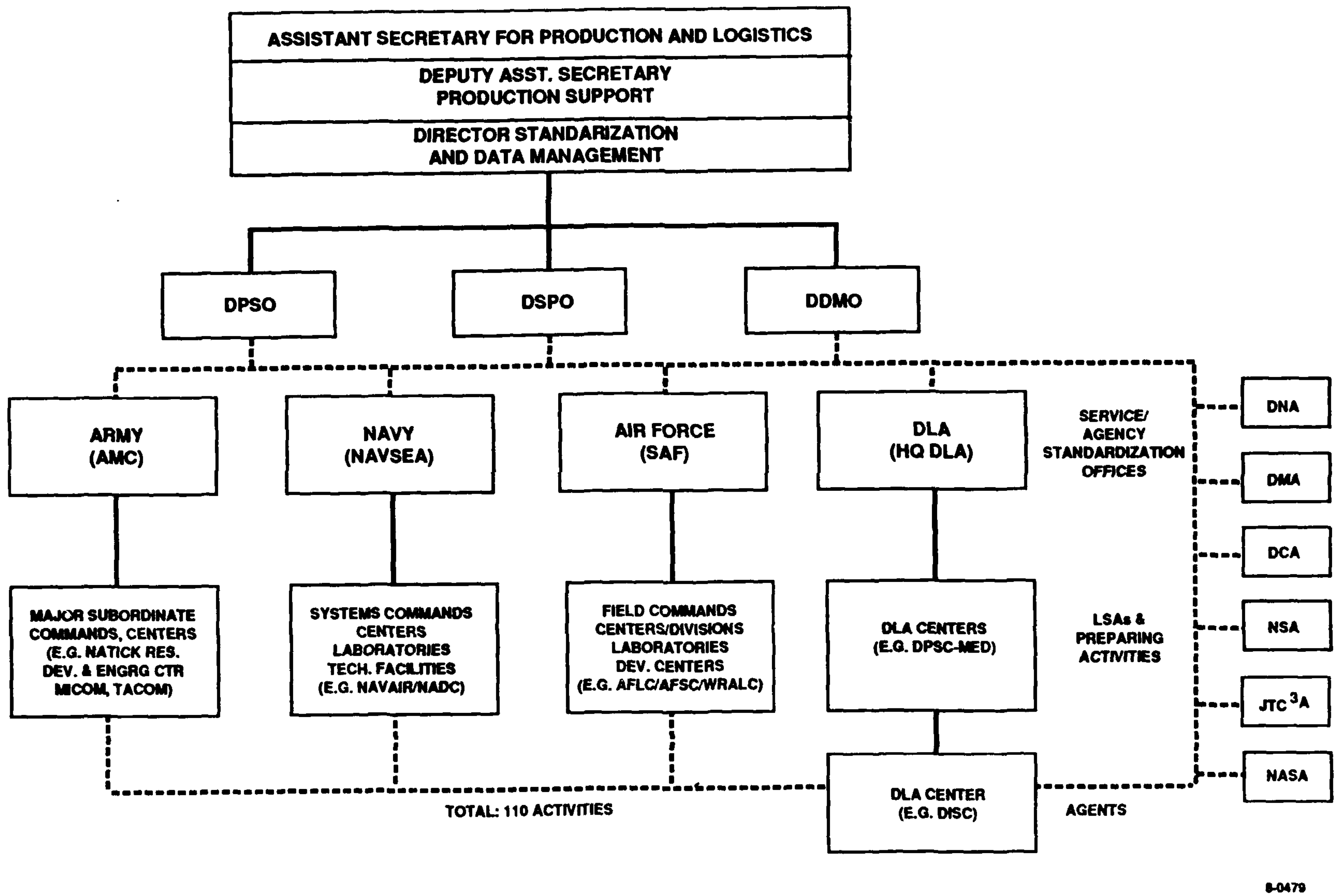
DEFENSE PRODUCT STANDARDS OFFICE
DIR: J. WYATT
EXT. 2343
(DPSO)

- PRODUCT STDZN
- PARTS CONTROL
- QUALIFICATION (QPLs/QMLs)
- CERTIFICATION
- INTNL STDZN
- TECHNOLOGY-AREAS
- APPLICATION POLICY
- ACQN PROGRAM REVIEW
- METRICATION
- STD MIL DWG PGM
- ANTI-COUNTERFEITING
- LIVING SPEC

DEFENSE DATA MANAGEMENT OFFICE
DIR: C. BERRY
EXT. 2554
(DDMO)

- TECH DATA MGMT
- TECH MANUAL MGMT
- ENGR DRAWING PRACTICES
- CONFIG MGMT (NAT'L/INTERNAT'L)
- *REVERSE ENGINEERING*
- TECHNICAL DATA AUTOMATION
- OMB DATA CLEARANCE
- REPLENISHMENT PARTS PURCHASE OR BORROW PROGRAM

8 2383


ASSISTANT SECRETARY FOR PRODUCTION AND LOGISTICS
DEPUTY ASST. SECRETARY PRODUCTION SUPPORT
DIRECTOR STANDARIZATION AND DATA MANAGEMENT
DPSO
DSPO
DDMO
ARMY (AMC)
NAVY (NAVSEA)
AIR FORCE (SAF)
DLA (HQ DLA)
SERVICE/ AGENCY STANDARDIZATION OFFICES
DNA
DMA
DCA
NSA
JTC 3A
NASA
MAJOR SUBORDINATE COMMANDS, CENTERS (E.G. NATICK RES. DEV. & ENGRG CTR MICOM, TACOM)
SYSTEMS COMMANDS CENTERS LABORATORIES TECH. FACILITIES (E.G. NAVAIR/NADC)
FIELD COMMANDS CENTERS/DIVISIONS LABORATORIES DEV. CENTERS (E.G. AFLC/AFSC/WRALC)
DLA CENTERS (E.G. DPSC-MED)
LSAs & PREPARING ACTIVITIES
DLA CENTER (E.G. DISC)
AGENTS
TOTAL: 110 ACTIVITIES
8-0479

DIRECTIVES AND PUBLICATIONS

			(703) 756. . . AV 289. . .
DODI 2045.2	AGREEMENT WITH AUSTRALIA AND CANADA FOR QUALIFICATION OF PRODUCTS OF NON-RESIDENT MANUFACTURERS	S. MILLER	-2343
DODD 4120.3	DEFENSE STANDARDIZATION AND SPECIFICATION PROGRAM	L. ROGERS	-2340
DOD 4120.3-M	DEFENSE STANDARDIZATION AND SPECIFICATION PROGRAM POLICIES, PROCEDURES AND INSTRUCTIONS	L. ROGERS & S. LOWELL	-2340
DODD 4120.11	STANDARDIZATION OF MOBILE ELECTRIC POWER GENERATING SOURCES	R. GAGNON	-2343
DODI 4120.19	DOD PARTS CONTROL PROGRAM	R. KUNIHIRO	-2343
DODI 4120.20	DEVELOPMENT AND USE OF NON-GOVERNMENT SPECIFICATIONS AND STANDARDS	S. LOWELL	-2340
DODI 4151.9	DOD TECHNICAL MANUAL PROGRAM MANAGEMENT	J. WINTERS	-2554
DODD 5000.37	ACQUISITION AND DISTRIBUTION OF COMMERCIAL PRODUCTS (ADCoP)	G. SAUNDERS	*
DODI 5010.12	MANAGEMENT OF TECHNICAL DATA	C. BERRY	-2554
DODD 5010.19	CONFIGURATION MANAGEMENT	L. BURGHER	-2554
DODD 4120.18	METRIC SYSTEM OF MEASUREMENT	J. TASCHER	-2343
DODI 4120.23	DOD METRICATION PLAN	J. TASCHER	-2343

*202-695-7915/AV 225-7915

8-0876

STANDARDIZATION MANAGEMENT RESPONSIBILITIES

OVERALL DSSP MANAGEMENT	DOCUMENT MANAGEMENT	FSC/AREA MANAGEMENT
ASD (P&L)	PREPARING ACTIVITY (or MCA)	LEAD STDZN ACTIVITY (ASSIGNEE/LSA)
DASD (PS)	CUSTODIAN	PARTICIPATING ACTIVITY
DIRECTOR, SDM	REVIEW	
DSPO/DPSO	USER	
DepSO		
SMA		

7 3724

STANDARDIZATION MANAGEMENT ACTIVITY (SMA)

- LEAD STANDARDIZATION ACTIVITY (ASSIGNEE/LEAD SERVICE ACTIVITY)
- PREPARING ACTIVITY
- MILITARY COORDINATING ACTIVITY
- PARTICIPATING ACTIVITY
- CUSTODIAN
- REVIEW
- USER
- AGENT
- ITEM REDUCTION STUDY PREPARING ACTIVITY

AND CONSULTANT TO THE COMMANDER ON PRODUCT STANDARDIZATION

7 3724

SERVICE / AGENCY STANDARDIZATION EXECUTIVES

ARMY - MR. DAROLD GRIFFIN - HQ, AMC

NAVY - MR. GERARD HOFFMANN - OASN (S&L)

AIR FORCE - BGEN JOHN DOUGLASS - SAF/AQX

DLA - MR. RICHARD BRUNER - DLA-S

DEPARTMENTAL STANDARDIZATION OFFICES (DEPSO'S)

ARMY	NAVY	AF	DLA*
AMCPD-SE (202) 274-6699 AV 284-6699	NAVSEA-55ZD (202) 692-0160 AV 222-0160	SAF/AQXA (202) 695-4648 AV 225-4648	DLA-SE (202) 274-6781 AV 284-6781
JIM SULLIVAN	DAVID NELSON	COL OAK DEBERG	HENRY FILIPPI

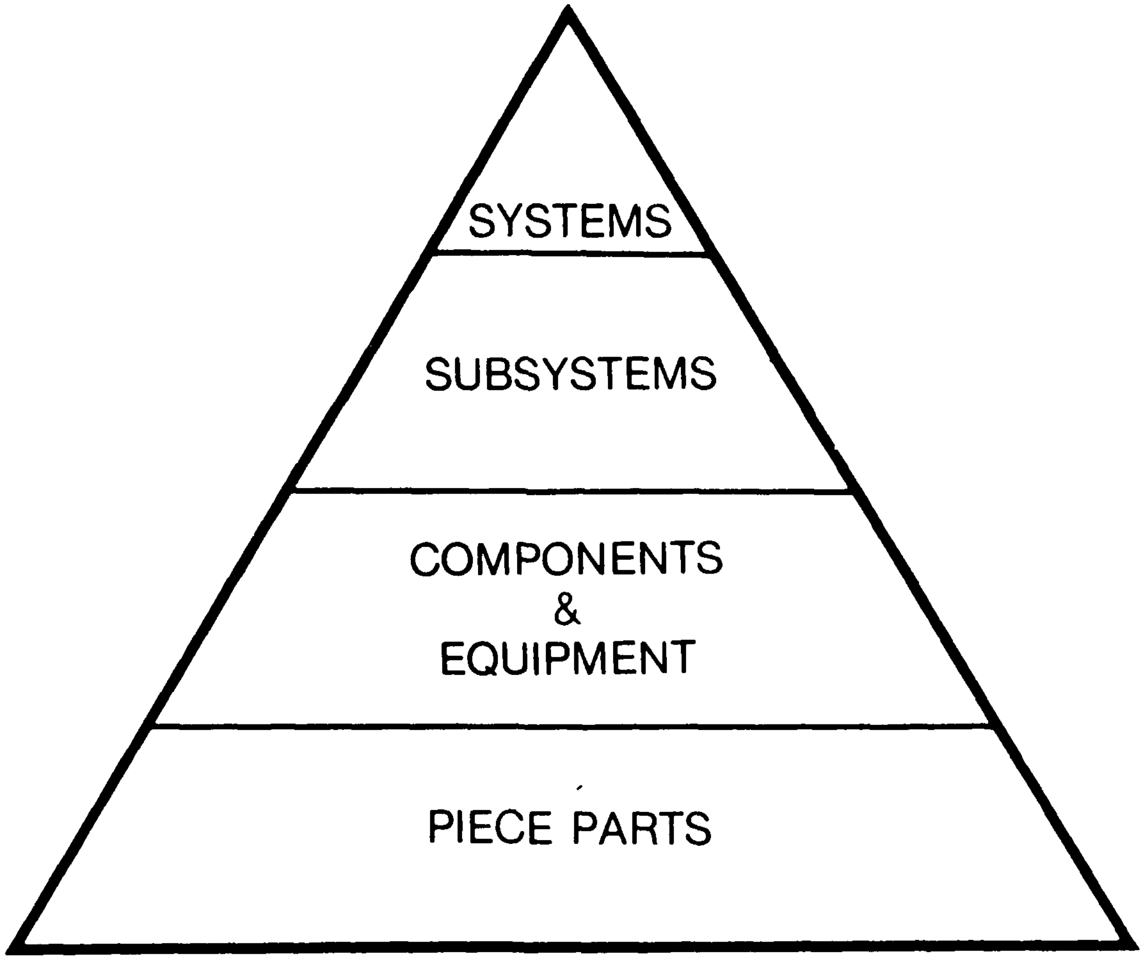
*THE DEFENSE LOGISTICS AGENCY IS ACCORDED CERTAIN DEPSO PRIVILEGES NORMALLY RESERVED FOR DEPARTMENTS

' 3724

IS STANDARDIZATION OCCURRING AS RAPIDLY AS IT SHOULD?

7 1357

OPPORTUNITY FOR ACHIEVING MATERIEL STANDARDIZATION

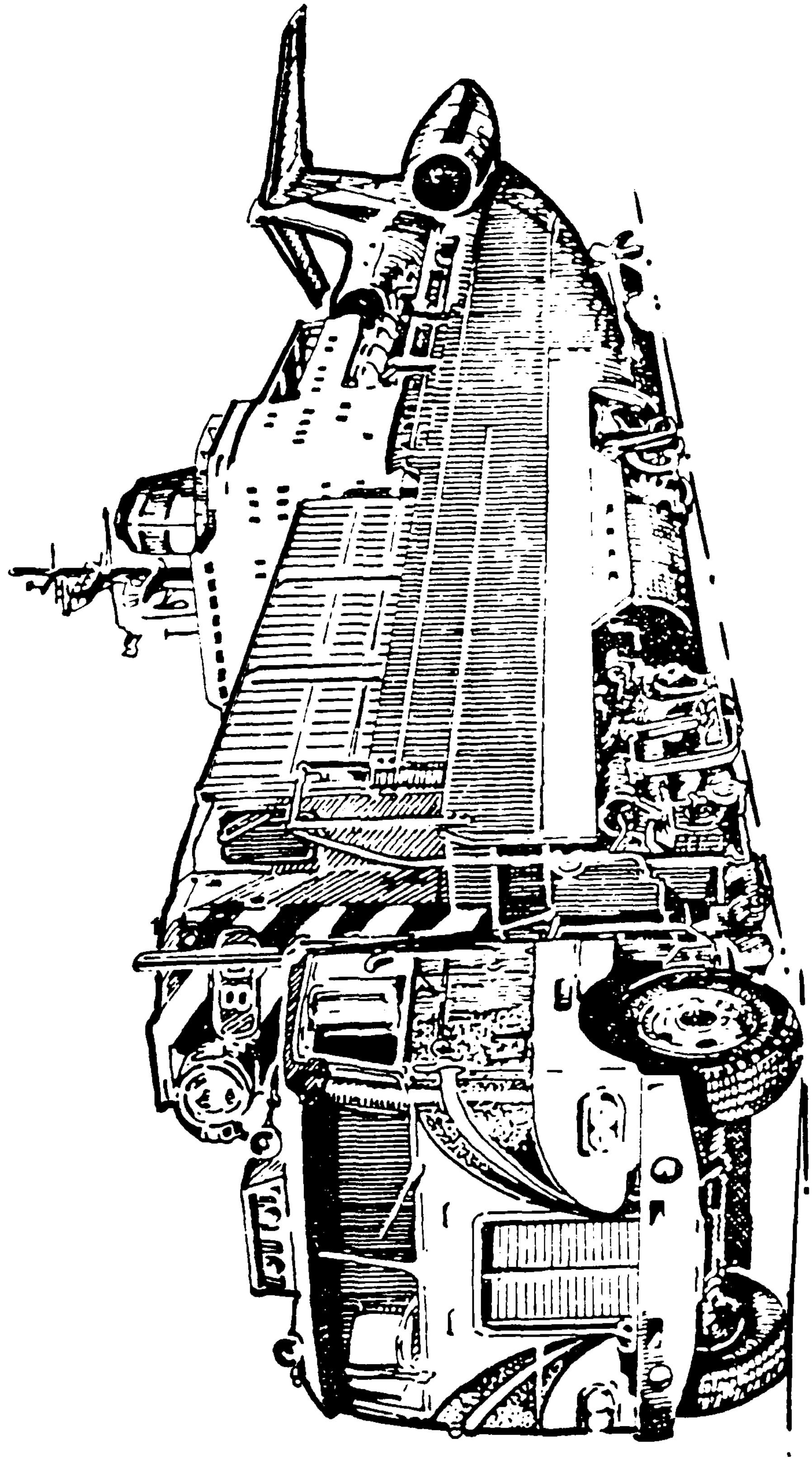


2364-3

PERCENT COMMONALITY OF ITEMS AMONG MILITARY SERVICES

31 DEC 71		79	80	81	82	83	84
45.5	ARMY	54.7	57.2	57.3	58.3	58.2	57.5
32.2	NAVY	34.0	33.8	34.1	34.4	34.6	34.3
32.5	AIR FORCE	35.1	36.1	36.0	36.8	37.1	37.6
69.1	MARINE CORPS	77.6	80.2	79.7	81.3	81.7	82.9

1722-5



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EVENTS IMPACTING ON FUTURE OF STANDARDIZATION

- INCREASED INTERNATIONAL STANDARDIZATION
- "BUY COMMERCIAL" POLICY
- USE OF NON-GOVERNMENT STANDARDS
- METRIC CONVERSION
- CONGRESSIONAL EMPHASIS ON SUBSYSTEM/EQUIPMENT STANDARDIZATION

7 1357

CURRENT STANDARDIZATION INITIATIVES

- NON-GOVERNMENT STANDARDS
- REVITALIZE STDZN. PROGRAM PLANNING
- SUBSYSTEM/EQUIPMENT STANDARDIZATION
- METRICATION
- CERTIFICATION
- QUALIFICATION
- PARTS CONTROL PROGRAM
- STANDARDIZED MILITARY DRAWING PROGRAM
- REVISIONS TO MIL-STDs-961, 962, 963 & 970
- AUTOMATION OF THE STANDARDIZATION PROGRAM

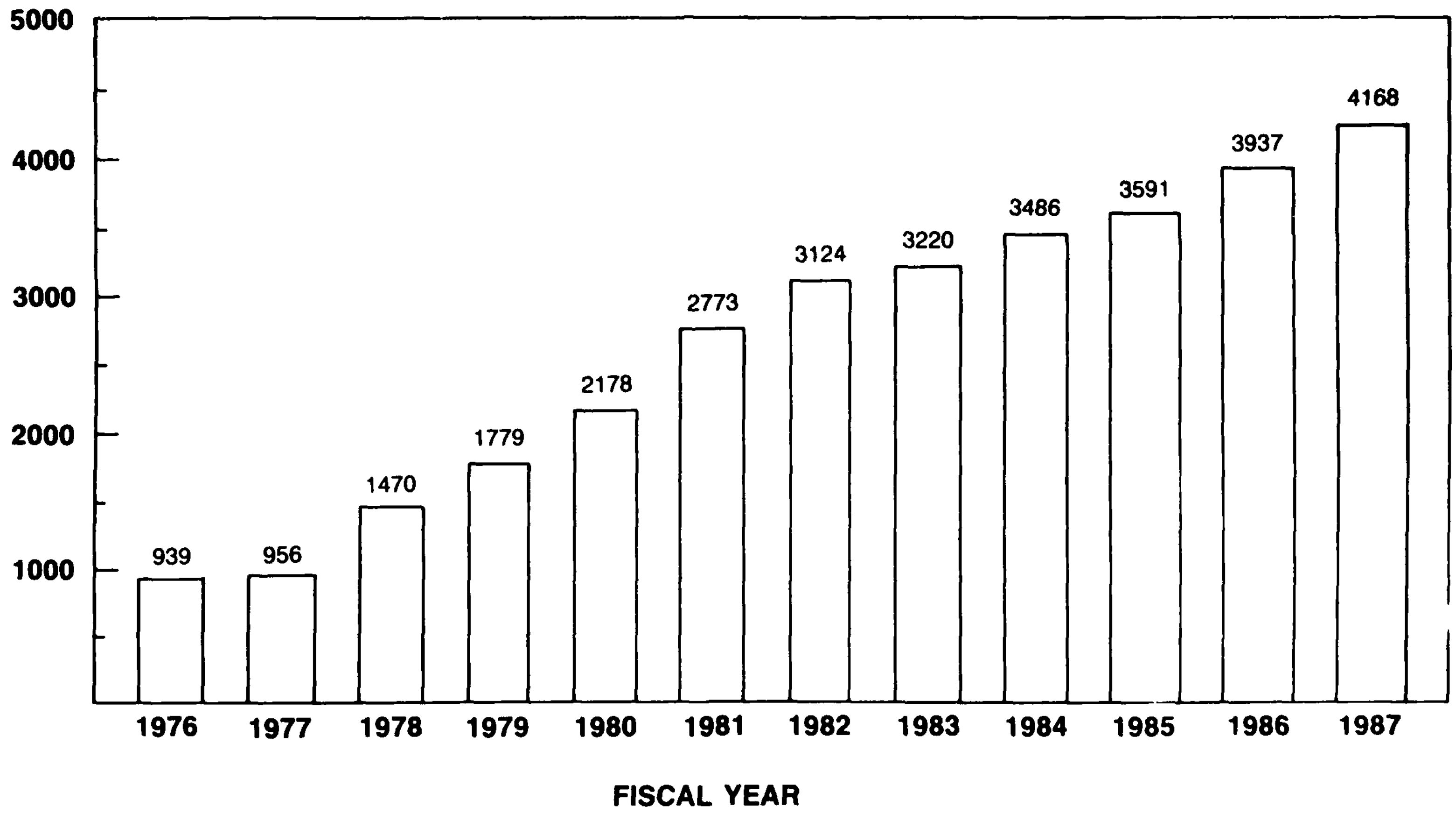
8 2743

CURRENT STANDARDIZATION INITIATIVES (CONT'D)

- COMMERCIAL/NDI ACQUISITION
- GUIDE SPECIFICATIONS
- COST/BENEFIT ANALYSIS
- AWARDS PROGRAM
- CONFERENCES/WORKSHOPS

8-2743

NON-GOVERNMENT STANDARDS GROWTH



7-0653

SUBSYSTEM/EQUIPMENT STANDARDIZATION

- OBJECTIVE - DEVELOP AN APPROACH THAT LEADS TO MORE STANDARD S/E BEING DEVELOPED AND USED

- DEFENSE SCIENCE BOARD (DSB) - 1983 SUMMER STUDY

  —JLCs SHOULD ESTABLISH A FORMAL MECHANISM FOR ACHIEVING OBJECTIVE

- UNDER SECRETARY OF DEFENSE (R&E) MEMORANDUM OF 18 JUNE 1984

  —REQUIRES JLCs IMPLEMENT DSB RECOMMENDATION

7-0653

SUBSYSTEM/EQUIPMENT STANDARDIZATION TECHNIQUES

- GEOGRAPHICAL STANDARDIZATION
- MULTI—YEAR PROCUREMENT
- MULTIPLE AWARD SCHEDULES
- ACQUISITION PLANNING
- OTHER THAN FULL AND OPEN COMPETITION
  - FAR 52.215-4
  - FAR 6.302-1 (b) (6)
  - DFAR 6.302-1 (c) (70)

7-3084

REVITALIZE STANDARDIZATION PROGRAM PLANS

- BRIEFINGS TO OASD(P&L)/DepSO's ON SELECTED FSC's
- ALLOW FLEXIBLE FORMAT
- ADDRESS R & D EFFORTS
- ADDRESS OPERATIONAL/MAINTENANCE PROBLEMS
- IDENTIFY RESOURCES (MANPOWER)
- ELVATE APPROVAL LEVEL
- ADMINISTRATIVE CHANGES

8-0479

DOD METRICATION PROGRAM

- OBJECTIVES:
  - INTEROPERABILITY WITH ALLIES
  - ECONOMIC GAINS
  - SMOOTH TRANSITION
  - METRIC IN NEW DESIGNS
- POLICY BACKGROUND
  - METRIC CONVERSION ACT OF 1975
  - METRIC CONVERSION POLICY FOR FEDERAL AGENCIES
  - DODD 4120.18 "METRIC SYSTEM OF MEASUREMENT."

8-0479

DOD METRICATION PROGRAM

- DOD POLICY, PLANS, AND STRUCTURE ESTABLISHED
- SEVERAL DOD METRIC INITIATIVES UNDERWAY
- REASONS FOR METRIC
  - INTEROPERABILITY WITH NATO
  - ECONOMIC GAINS
- PROBLEMS - RESOLUTION
  - CHICKEN - EGG PROBLEM
  - INITIAL METRIC COST
  - JUSTIFICATION FOR NON METRIC IN NEW DESIGNS

8-0479

DOD METRICATION PROGRAM

MEETING DEMAND FOR METRIC STANDARDS

- SURVEY OF ASSIGNEE ACTIVITIES - DEMAND
- DOCUMENT REVIEW - RESPONSE
- METRIC IDENTIFIERS IN DODISS - TRACKING
- SAE CONTRACT - PROPULSION DOCUMENTS
- AIA - AIRFRAME DOCUMENTS

8-0479

CERTIFICATION

CERTIFICATION THE PROCEDURE BY WHICH ASSURANCE IS GIVEN THAT A PRODUCT OR SERVICE CONFORMS TO A STANDARD OR SPECIFICATION

THIRD-PARTY CERTIFICATION A FORM OF CERTIFICATION IN WHICH THE PRODUCER'S CLAIM OF CONFORMITY IS VALIDATED, AS PART OF A THIRD-PARTY CERTIFICATION PROGRAM, BY A TECHNICALLY AND OTHERWISE COMPETENT BODY OTHER THAN ONE CONTROLLED BY THE PRODUCER OR THE BUYER

8-2844

THIRD-PARTY CERTIFICATION PROGRAM

AN ORGANIZED SYSTEM (1) UNDER WHICH SIMILAR PRODUCTS OR SERVICES OF ANY NUMBER OF PRODUCERS MAY BE CERTIFIED AS CONFORMING TO THE REFERENCED STANDARDS OR SPECIFICATIONS ON A UNIFORM AND EQUITABLE BASIS, (2) WHICH USES OR IS OPERATED BY A THIRD-PARTY INSPECTION/TESTING BODY, AND (3) WHICH AUTHORIZES THE USE OF CONTROLLED CERTIFICATION MARKS OR CERTIFICATES OF CONFORMITY AS EVIDENCE OF CONFORMITY

8-2844

CERTIFICATION PROGRAM

- WIDELY RECOGNIZED SPECS. & STDS.
- DECLARATION OF CONFORMITY
- FORMAL LISTING OF SUPPLIERS
- REGISTRATION PROGRAM
- QUALITY TESTING PROGRAM

8-2743

"NATIONAL PRODUCT CERTIFICATION/APPROVAL SYSTEM"

THE NEED FOR:

- NON-GOVERNMENT SPONSORSHIP
- INDUSTRY SUPPORT
- GOVERNMENT ENDORSEMENT

8-2743

QUALIFICATION

DEFENSE PROCUREMENT REFORM ACT (P.L. 98-525)

- OBLIGATED TO CONSIDER ALL SMALL BUSINESS PRODUCTS FOR INCLUSION ON QPL
- MAY REIMBURSE QUALIFICATION TESTING COSTS
- QUALIFICATION MAY ONLY BE WAIVED IN AN EMERGENCY; OTHERWISE QR MUST BE REJUSTIFIED
- ACKNOWLEDGED QUALIFIED MANUFACTURERS LIST

7-0653

WHY CHANGES TO QPL?

PERCEPTION BY CONGRESS: QPLs ARE BAD FOR SMALL BUSINESSES

REALITY: 69% OF FIRMS ON QPLs ARE SMALL BUSINESSES (BASED ON SAMPLE SIZE OF 20% OF QPLs)

6 08.

QUALIFICATION

CURRENT STATUS:

- PILOT TEST CASE IS QML-38510-1 (CUSTOM HYBRID MICROCIRCUITS)
  - APPROVED MARCH 31, 1986
  - USABILITY DATA RECEIVED DECEMBER 1986
  - IF FEASIBLE, MANUAL ADDITION
  - CANDIDATES WOULD BE HIGH TECH PRODUCTS SUCH AS CUSTOM HYBRID MICROCIRCUITS; VHSIC; PRINTED WIRING BOARDS

7 2216

PARTS CONTROL PROGRAM

- DOD I.G. REPORT
  - PROGRAM NOT USED ON SOME SYSTEMS/EQUIP. ACQUISITIONS
  - SERVICES CONDUCT DUPLICATIVE PARTS REVIEWS
  - MAJORITY OF AGREED TO RECOMMENDATIONS NOT IMPLEMENTED BY CONTRACTORS
- CONCLUSION—PROGRAM NEEDS TEETH

PARTS CONTROL PROGRAM

- DEPUTY SECRETARY OF DEFENSE MEMO OF 12 DEC 1984

- DIRECTS SERVICES/DLA TO

  —USE PCP ON ALL APPLICABLE ACQUISITION PROGRAMS

  —INSTRUCT CONTRACTORS TO USE MPCAG RECOMMENDED PARTS UNLESS WAIVER OBTAINED FROM PROGRAM MANAGER

  —ELIMINATE DOUBLE REVIEWS

  —CONDUCT PERIODIC REVIEWS TO ENSURE ABOVE & REPORT TO OSD

7-2216

STANDARDIZED MILITARY DRAWING PROGRAM (SMDP)

- **PURPOSE:**
  - AVOID PROLIFERATION OF SCDs DESCRIBING GENERIC MICROCIRCUITS AS IF THEY WERE PROGRAM UNIQUE DEVICES
  - INCREASE COMPETITION
  - INCREASE MANUFACTURING BASE
  - PROVIDE SUBSTANTIAL SAVINGS IN BOTH ACQUISITION AND LOGISTICS
- **SIGNIFICANT ISSUES:**
  - SECDEF WEINBERGER'S LTR TO SENATOR LEVIN - 16 JUNE 86
  - DEPUTY ASSISTANT SECRETARY (PRODUCTION SUPPORT) MITTINO MEMO TO MIL DEPTS - 24 JUNE 86
  - DEPUTY ASSISTANT SECRETARY MITTINO LTRS TO INDUSTRY ASSOCIATIONS (NSIA, AIA, EIA, SIA) - 24 JUN 86
  - SMDP IMPLEMENTATION AS OF 1 OCTOBER 86 (MICROCIRCUITS ONLY)

7 2216

STANDARDIZED MILITARY DRAWING PROGRAM (SMDP)

STATUS:

- DESC SERVES AS CENTRAL PROGRAM COORDINATOR
- PREPARING MILITARY HANDBOOK (GUIDANCE IN PREPARATION OF DRAWINGS)
- PREPARING MILITARY BULLETIN LISTING ALL SMDs
- ALL APPLICABLE DOCUMENTS (SUCH AS MIL-STD-965A) BEING CHANGED TO SPECIFY SMDP
- OSD MEMORANDUM TO THE SERVICE SECRETARIES PROVIDING BROAD PROGRAM IMPLEMENTATION GUIDELINES

7 2216

MIL-STD-961

- REVISION "C" DATED 20 MAY 1988 ISSUED
- MAJOR CHANGES
  - CHANGED SECTION ON DATA REQUIREMENTS TO CLARIFY WHEN DOCUMENTS WILL REQUIRE AN AMSC NUMBER
  - COMBINED REQUIREMENTS ON PART NUMBERS AND BULK MATERIAL IDENTIFICATION NUMBERS TO CREATE A PART OR IDENTIFYING NUMBER (PIN)
  - ESTABLISHED NEW REQUIREMENTS FOR IDENTIFYING WHETHER A MIL-SPEC IS METRIC, INCH-POUND, OR NOT MEASUREMENT SENSITIVE
  - ALLOWS FOR MILITARY SPECIFICATION SHEET TO BE PREPARED ON A NEWLY REVISED DD-FORM 672
  - PROHIBITS AQL's AND LTPD's
  - ADDED REQUIREMENT FOR VALIDATION NOTICE
- REVISION IN PREPARATION

MIL-STD-962

- REVISION "B" ISSUED 20 MAY 1988
- MAJOR CHANGES
  - ADDED REQUIREMENTS FOR MILITARY BULLETINS
  - DELETED REQUIREMENTS FOR UNIT PAGE STANDARDS AND TRANSFERRED MS SHEET FORM STANDARD REQUIREMENTS TO MIL-STD-961C
  - CHANGED SECTION ON DATA REQUIREMENTS TO CLARIFY WHEN DOCUMENTS WILL REQUIRE AN "AMSC" NUMBER
  - ESTABLISHED NEW REQUIREMENTS FOR IDENTIFYING WHETHER A MIL-STD OR MIL-HDBK IS "METRIC", "INCH-POUND", OR "NOT MEASUREMENT SENSITIVE"
  - ADDED REQUIREMENTS FOR VALIDATION NOTICE
- REVISION IN PREPARATION

ORDER OF PREFERENCE
(MIL-STD-970)*

1. MULTI-NATIONAL TREATY ORGANIZATION STANDARDIZATION AGREEMENTS AND FEDERALLY MANDATED RULES AND REGULATIONS
2. NON-GOVERNMENT STANDARDS
   - ADOPTED INTERNATIONAL STANDARDS
   - ADOPTED U.S. NON-GOVERNMENT STANDARDS
   - OTHER INTERNATIONAL/U.S. NON-GOVERNMENT STANDARDS
3. COMMERCIAL ITEM DESCRIPTIONS
4. FEDERAL SPECIFICATIONS/STANDARDS
5. FULLY COORDINATED MIL/DOD SPECIFICATIONS/STANDARDS
6. LIMITED COORDINATED MIL/DOD SPECIFICATIONS/STANDARDS
7. LOCALLY PREPARED ONE-TIME USE PURCHASE DESCRIPTIONS

* REPLACES MIL-STD-143

8-0479

STREAMLINING

- DODD 5000.43
  - GUIDANCE PRIOR TO FULL SCALE DEVELOPMENT
  - 1ST TIER FOR FULL SCALE DEVELOPMENT
  - ALL TIERS FOR PRODUCTION
- SECTIONALIZED MIL-STD'S
- MIL-SPEC OPTIONS
- MIL-HDBK-248

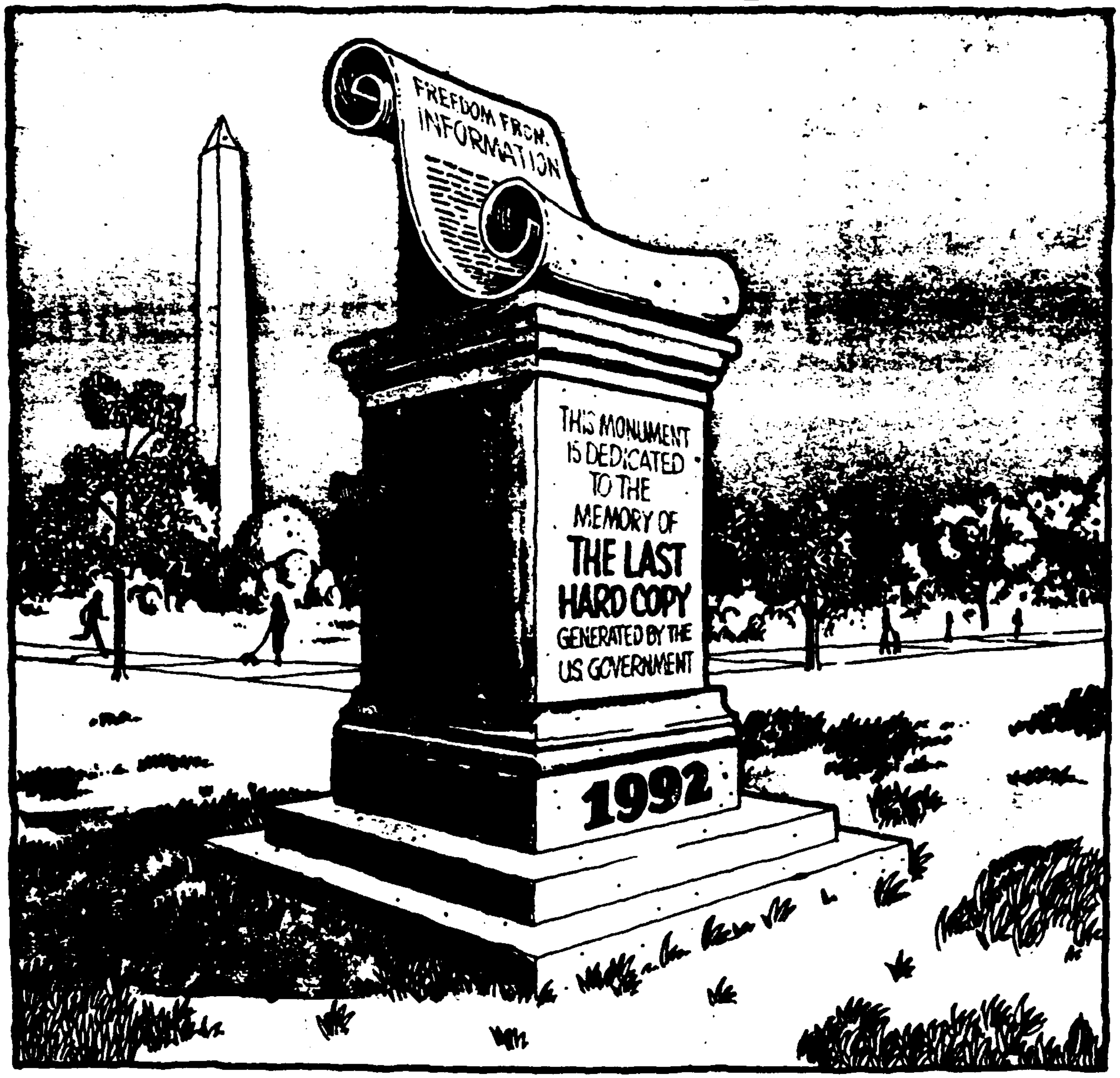
SYSTEM SPECS & PURCHASE DESCRIPTIONS

(AKA NON-DODISS DOCUMENTS)

- ONE - TIME USE
- MIL-STD-490 VS. MIL-STD-961
- CONVERSION TO DODISS DOCUMENTS

  WHY? WHEN? HOW?
- AUTOMATION OF SYSTEM SPEC DEVELOPMENT

A GLIMPSE OF THE FUTURE?



8-2743

STANDARDIZATION AUTOMATION SYSTEM

- DoD WIDE SPECIFICATION TIERING/REFERENCING SUB-SYSTEM
- DoD WIDE SPECIFICATION/STANDARD INDEXING AND RETRIEVAL SUB-SYSTEM
- DoD WIDE STANDARDIZATION PROJECT MANAGEMENT DATA BASE SUB-SYSTEM
- DoD WIDE SYSTEM SPECIFICATION AUTHORING SUB-SYSTEM
- DoD WIDE MILITARY SPECIFICATION/STANDARD AUTHORING SUB-SYSTEM
- DoD WIDE ELECTRONIC MAIL COORDINATION SUB-SYSTEM
- DoD WIDE SPECIFICATION/STANDARD APPLICATION TRACKING SUB-SYSTEM

7 0653

STANDARDIZATION AUTOMATION MANAGEMENT

- OSD STANDARDIZATION AUTOMATION MANAGER (OASD (P&L) DSPO)
- SINGLE STANDARDIZATION AUTOMATION SYSTEMS INTEGRATOR

  (SELECTION PENDING — PRIME CANDIDATE IS NAVSUP'S NPFC)

8 1541

CONGRESSIONAL HISTORY ON "BUY COMMERCIAL"

- FY 83 SUPPLEMENTAL APPROPRIATIONS ACT
- FY 84 AND FY 85 APPROPRIATIONS ACT
  - CONTAINED FOLLOWING RESTRICTION:
    - —CANNOT REQUIRE SMALL BUSINESS TO:
      - —DEMONSTRATE PRODUCTS ARE ACCEPTABLE IN COMMERCIAL MARKET
      - —SATISFY ANY OTHER PREQUALIFICATION TO SUBMITTING A BID
- FY 86 APPROPRIATION CONTAINS NO RESTRICTIONS
- PACKARD COMMISSION RESULTS ENDORSED BY CONGRESS
- FY 87 LEGISLATION ON PREFERENCE FOR NON-DEVELOPMENT ITEMS

7-3724

BUY COMMERCIAL (ADCoP/NDI) OPTIONS

- USE NON-GOVERNMENT STANDARDS
- USE EXISTING CIDs W/Q.A.
- ALLOW MAXIMUM FLEXIBILITY
  - CIDs WITH OR W/O QA
  - SIMPLIFIED FEDERAL SPECIFICATIONS
- USE COMMERCIAL OR PRIVATE SECTOR BUYING TECHNIQUES

7-065

COMMERCIAL/NDI ACQUISITION

- DFARS CASE ON ADCoP
- DoDD 5000, 37
- NDI HANDBOOK
- DoD TASK GROUP ON COMMERCIAL AQUISITION
- REVISED CID GUIDELINES

7-1357

GUIDE SPECIFICATIONS

- CONSTRUCTION
- AIRCRAFT
- COMBAT VEHICLES
- SHIPS

7-0653

COST/BENEFIT STUDY FOR STANDARDIZATION

- DEVELOPING METHODOLOGY; IDENTIFYING FACTORS
- ASSIST IN OBTAINING RESOURCES, REPORTING TO CONGRESS, ETC
- AREAS TO BE EXAMINED:
  - VALUES OF SPECIFICATIONS/STANDARDS AS
    - PROCUREMENT TOOLS
    - DESIGN TOOLS
  - VALUE OF QPLs
  - BENEFIT OF STANDARDIZING ON
    - PIECE PARTS
    - COMPONENTS/EQUIPMENT
    - ENGINEERING PRACTICES/PROCESSES
- UTILIZING CASE STUDY APPROACH

STANDARDIZATION AWARDS PROGRAM

- AWARDS TO:
  - STANDARDIZATION PERSONNEL
  - ENGINEERING/TECHNICAL SPECIALISTS
  - ORGANIZATIONS—DoD, CONTRACTORS, NON-GOVT. STDS. BODIES, & INDUSTRY ASSOCIATIONS
- NOMINATIONS BY:
  - OSD, SERVICES, AGENCIES, AND OTHER DoD ACTIVITIES
- APPROVAL BY:
  - DEPUTY ASSISTANT SECRETARY FOR PRODUCTION SUPPORT

8 1148

DoD STANDARDIZATION CONFERENCES

- STANDARDIZATION MANAGEMENT ACTIVITY (SD-1) CONFERENCE—SEPTEMBER 1-3, 1987, LEESBURG, VIRGINIA
- NON-GOVERNMENT STANDARDS CONFERENCE—NOVEMBER 17-19, 1987, WILLIAMSBURG, VIRGINIA
- 4TH ANNUAL TECHNICAL DATA MANAGEMENT CONFERENCE—FEBRUARY 22-26, 1988, BALTIMORE, MARYLAND
- STANDARDIZATION AND DATA MANAGEMENT (ACQUISITION) CONFERENCE—AUGUST 22-24, 1988, WASHINGTON, D.C. METRO AREA

8-2743

WRAP-UP

&

FINAL EXAM

STARTING A MIL-SPEC

1. CONTACT THE USERS OF THE PRODUCT
2. CONDUCT A MARKET SURVEY/ANALYSIS
3. SELECT AN EXISTING NON-GOVERNMENT STANDARD (NGS)
4. JOIN AN EXISTING NGS BODY OR COMMITTEE
5. START A NEW NGS ACTIVITY
   - NOW, IF THERE'S TIME
   - LATER, IF THERE'S NO TIME
6. DEVELOP A COMMERCIAL ITEM DESCRIPTION (CID)
7. DEVELOP A FEDERAL SPECIFICATION

8. NOW, AND ONLY IF IT'S A MILITARY ITEM,

"REVISE AN EXISTING OR PREPARE A NEW"
MIL-SPEC

FUTURE STANDARDIZATION CHALLENGES

- MAINTAIN TRADITIONAL ASPECTS OF DSSP
- DEVELOP MORE STANDARD COMPONENTS AND EQUIPMENT
- ESTABLISH APPROACHES FOR USING MORE STANDARD COMPONENTS AND EQUIPMENT

8-1541

1988 DOD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

TUTORIAL B

CONFIGURATION MANAGEMENT

LINDA S. BURGHER
SENIOR STAFF SPECIALIST
OASD(P&L)DDMO

This tutorial will provide an overview of the basic philosophy and practices of configuration management (CM), primarily as applied to the acquisition process. Basic policy and procedures of CM, as outlined in DoD Directives, and military standards and specifications will be discussed.

INTRODUCTION TO CONFIGURATION MANAGEMENT

PRESENTED BY
LINDA BURGHER
DDMO

8-5265

CM TUTORIAL OBJECTIVES

- FAMILIARIZATION WITH:
  - CM POLICY/DOCUMENTS
  - MEANING OF CM
  - CM RESPONSIBILITIES

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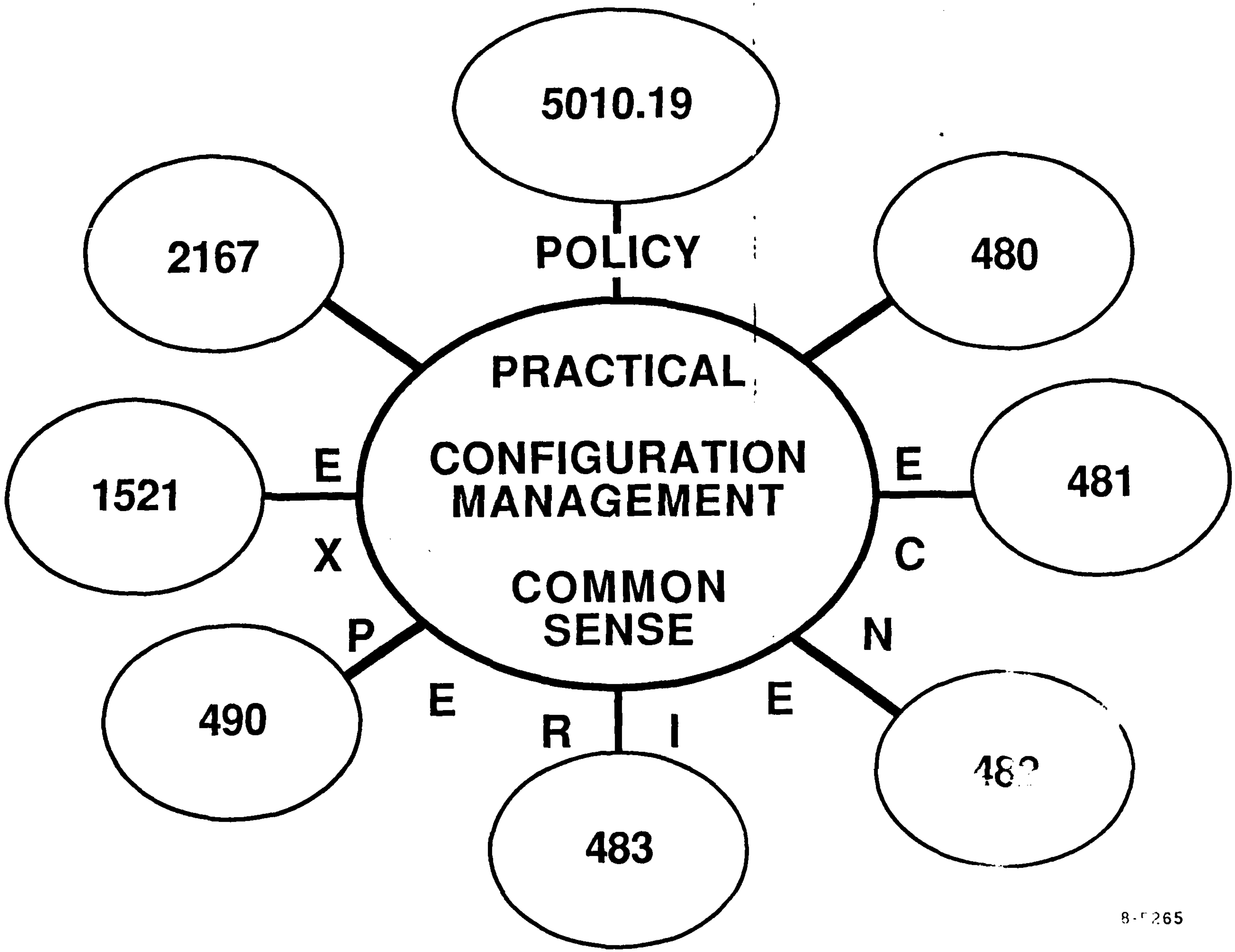
5010.19
POLICY
2167
480
PRACTICAL
CONFIGURATION MANAGEMENT
COMMON SENSE
1521
481
E X P E R I E N C E
490
483
48

TWO FACETS OF CONFIGURATION

- PHYSICAL
  - DRAWINGS
  - PARTS LISTS
  - SOFTWARE LISTINGS
- FUNCTIONAL
  - LOGISTICS CONSTRAINTS
  - INTERFACE REQUIREMENTS
  - PERFORMANCE REQUIREMENTS

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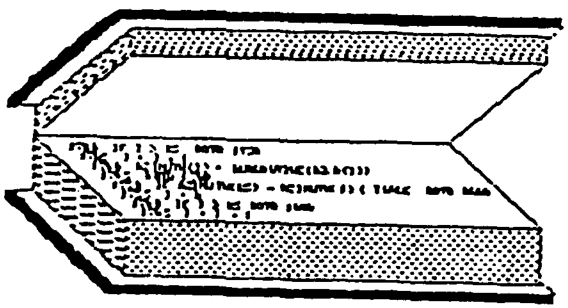
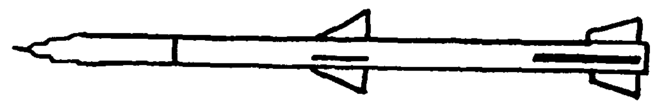
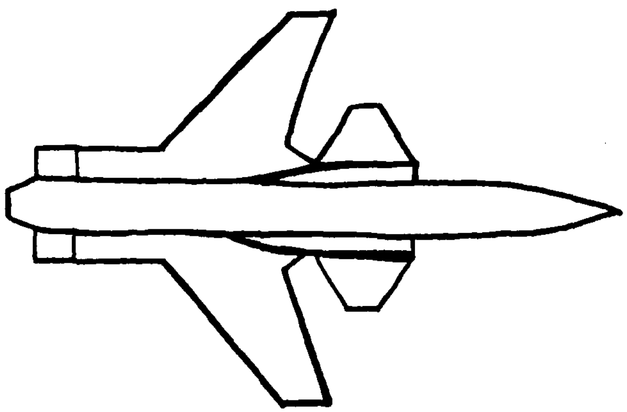
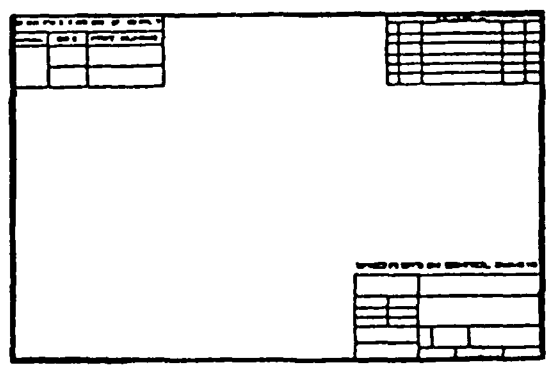
PHYSICAL

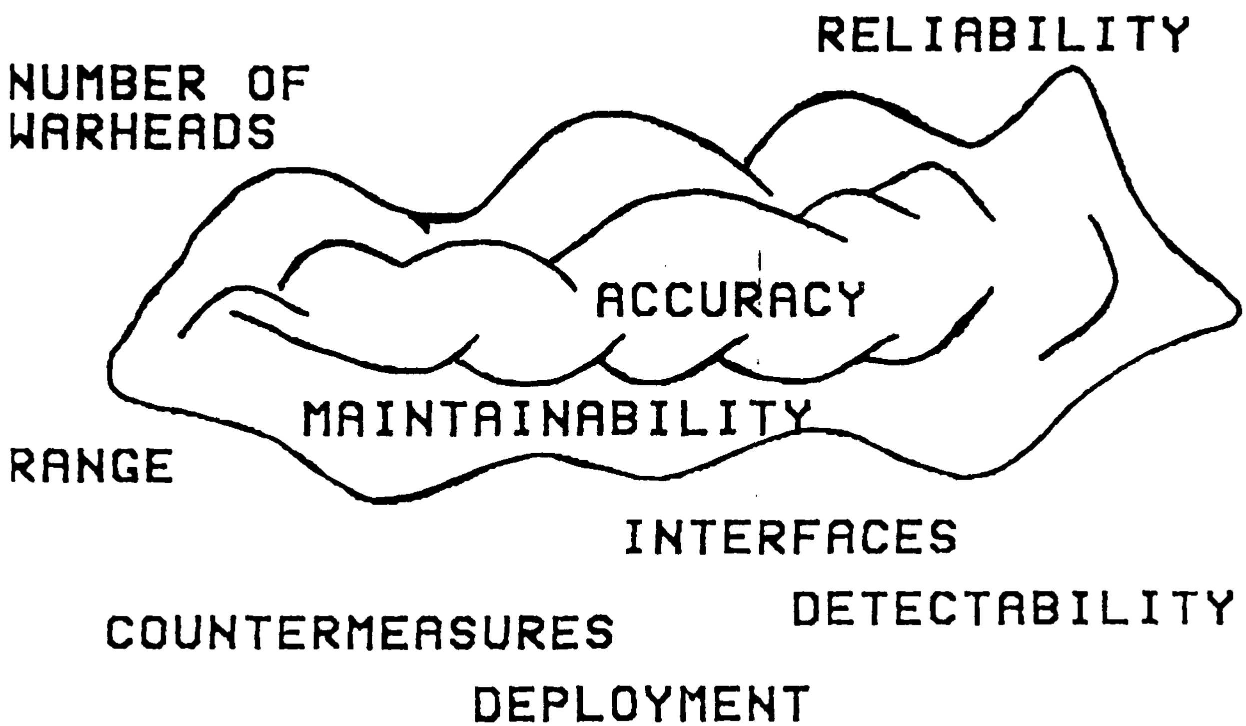






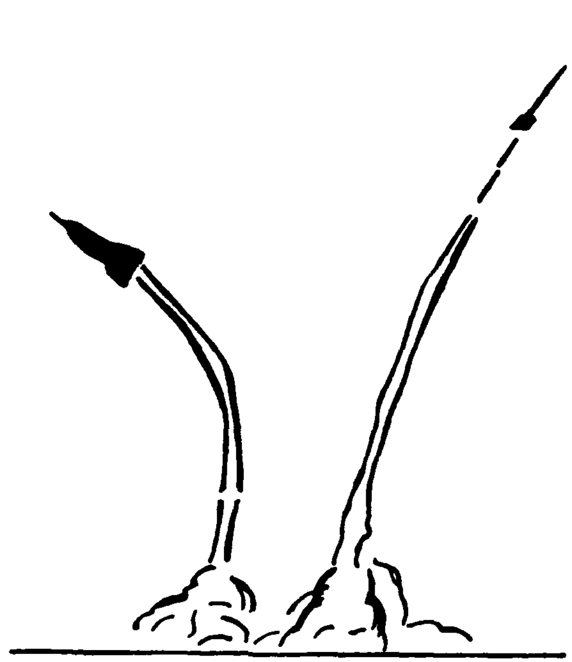


FUNCTIONAL

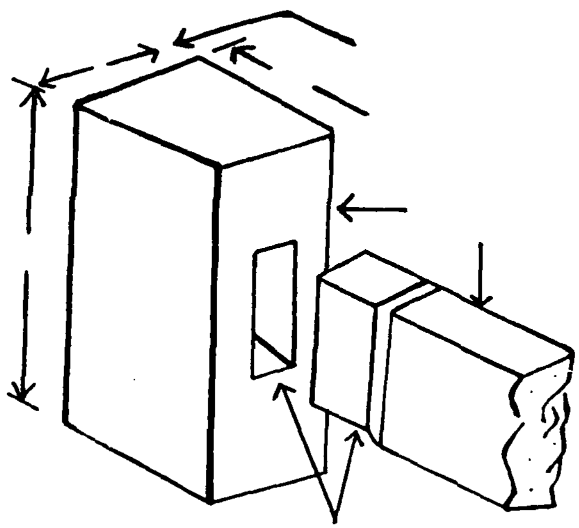

RELIABILITY
NUMBER OF
WARHEADS
ACCURACY
MAINTAINABILITY
RANGE
INTERFACES
DETECTABILITY
COUNTERMEASURES
DEPLOYMENT

C O N F I G U R A T I O N

THE FUNCTIONAL AND PHYSICAL CHARACTERISTICS OF MATERIAL AS DESCRIBED IN TECHNICAL DOCUMENTS AND ACHIEVED IN A PRODUCT.



FUNCTIONAL



PHYSICAL

CONFIGURATION MANAGEMENT

CONFIGURATION MANAGEMENT IS A DISCIPLINE APPLYING TECHNICAL AND ADMINISTRATIVE DIRECTION AND SURVEILLANCE TO IDENTIFY AND DOCUMENT THE FUNCTIONAL AND PHYSICAL CHARACTERISTICS OF CIs; AUDIT THE CI TO VERIFY CONFORMANCE TO SPECIFICATIONS, INTERFACE CONTROL DOCUMENTS AND OTHER CONTRACT REQUIREMENTS; CONTROL CHANGES TO CIs AND THEIR RELATED DOCUMENTATION; AND RECORD AND REPORT INFORMATION NEEDED TO MANAGE CIs EFFECTIVELY, INCLUDING THE STATUS OF PROPOSED CHANGES AND THE IMPLEMENTATION STATUS OF AP-PROVED CHANGES.

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CONFIGURATION MANAGEMENT

- CONFIGURATION MANAGEMENT IS:

  "THE MANAGEMENT OF DESIGN DOCU-MENTATION AND ITEMS PRODUCED FROM IT."

8-5265

CONFIGURATION MANAGEMENT PRACTICES

- IDENTIFICATION = DOCUMENTATION
  - PERFORMANCE REQUIREMENTS
  - OPERATIONAL DESIGN
- AUDITS = VERIFICATION
  - PERFORMANCE MET
  - DESIGN DOCUMENTED
- CONTROL = COMMUNICATION
  - SYSTEM ENGINEER ALL CHANGES
  - COMPLETE IMPACT DESCRIBED
- ACCOUNTING = TRACEABILITY
  - DOCUMENTATION - ISSUE THROUGH CURRENT
  - UNITS - DELIVERY THROUGH CURRENT

8-5205

CONFIGURATION IDENTIFICATION

CONFIGURATION IDENTIFICATION IS THE SELECTION OF THE DOCUMENTS TO COMPRISE THE BASELINE FOR THE SYSTEMS AND CIs INVOLVED AND THE NUMBERS AND OTHER IDENTIFIERS AFFIXED TO THE ITEMS AND DOCUMENTS.

8-5265

CONFIGURATION IDENTIFICATION

- CUSTOMER NEEDS DEFINED
- ENGINEERING GENERATES DOCUMENTATION
- GOVERNMENT PROGRESSIVELY CONTROLS
  - FUNCTIONAL - SYSTEM REQUIREMENTS
  - ALLOCATED - CI REQUIREMENTS
  - PRODUCT - CI DESIGN

8-5265

CONFIGURATION IDENTIFICATION

- PROVIDES THE SPECIFIC TECHNICAL DESCRIPTION OF AN ITEM AT ANY POINT IN TIME

CONFIGURATION IDENTIFIERS:

- NOMENCLATURE
- STOCK NUMBER
- SPECIFICATION, DRAWING AND PART NUMBER
- CI NUMBER
- SERIAL NUMBER/LOT NUMBER
- MOD NUMBER

BASELINE

A DOCUMENT OR SET OF DOCUMENTS FORMALLY DESIGNATED AND AT A SPECIFIC TIME

BASELINES:

- FUNCTIONAL
- ALLOCATED
- PRODUCT

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TECHNICAL DESIGN REVIEWS

- REVIEW EVOLVING DESIGN
- PERFORMANCE REQUIREMENTS IN SPECS
  - SYSTEM REQUIREMENTS REVIEW (SRR)
  - SYSTEM DESIGN REVIEW (SDR)
  - SOFTWARE SPECIFICATION REVIEW (SSR)
- DESIGN AGAINST BASELINE REQUIREMENTS
  - PRELIMINARY DESIGN REVIEW (PDR)
  - CRITICAL DESIGN REVIEW (CDR)
  - TEST READINESS REVIEW (TRR)

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CONFIGURATION AUDITS

- VERIFY DESIGN SUITABILITY

- BASELINE PERFORMANCE ACHIEVED
  - FUNCTIONAL CONFIGURATION AUDIT (FCA)
  - FORMAL QUALIFICATION REVIEW (FQR)

- PRODUCTION DESIGN DOCUMENTED
  - PHYSICAL CONFIGURATION AUDIT (PCA)

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CONFIGURATION AUDIT

THE CONFIGURATION AUDIT IS THE VERIFICATION OF A CI'S CONFORMANCE TO SPECIFICATIONS, DRAWINGS AND OTHER CONTRACT REQUIREMENTS.

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FUNCTIONAL CONFIGURATION AUDIT (FCA)

- DOES CI MEET BASELINE REQUIREMENTS?
  - TESTING FOLLOWED APPROVED PROCEDURES
  - ALL TESTING SUCCESSFULLY COMPLETED
  - DATA/REPORTS/ANALYSES VERIFIED
  - DATA VALID FOR FINAL CONFIGURATION
- RECORD FINAL TEST ITEM CONFIGURATION

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FORMAL QUALIFICATION REVIEW (FQR)

- DOES SYSTEM MEET BASELINE REQUESTS?
- SAME BASIC PROCEDURES AS FCA
- PROBLEM AREA ··> WRITEUP

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PHYSICAL CONFIGURATION AUDIT (PCA)

- PRODUCT SPEC DEFINES DESIGN
  - USE EARLY HARDWARE UNIT/SOFTWARE COPY
  - CHECK DELIVERABLE AGAINST SPEC DESIGN
    - COPY LISTING AGAINST SPEC LISTING
    - HARDWARE AGAINST SPEC REFERENCE DRAWINGS

- CHECK ENGINEERING RELEASE SYSTEM
  - ONLY CURRENT, APPROVED DOCUMENTS IN USE
  - OUTDATED DOCUMENTS/VERSIONS REMOVED

- ESTABLISH PRODUCT BASELINE
  - SIGN/AUTHENTICATE PRODUCT SPEC

8-5265

CONFIGURATION CONTROL

CONFIGURATION CONTROL IS THE SYSTEMATIC PROPOSAL, PROPOSED CHANGES, AND THE IMPLEMENTATION OF ALL APPROVED CHANGES IN THE CONFIGURATION OF A (CI) AFTER FORMAL ESTABLISHMENT OF ITS BASELINE.

8-5265

CM CONTROL - LIFE CYCLE PHASES

- *CONCEPT EXPLORATION PHASE* - FUNCTIONAL AND PHYSICAL CHARACTERISTICS
- *DEMONSTRATION AND VALIDATION PHASE* - BASELINES SYSTEM REQUIREMENTS AND FUNCTIONAL/PHYSICAL CHARACTERISTICS
- *FULL-SCALE DEVELOPMENT PHASE* - FUNCTIONAL AND ALLOCATED BASELINES FOR CI (s)
- *PRODUCTION AND DEPLOYMENT PHASE* - CI (s) IDENTIFIED AS PART OF THE PRODUCT BASELINE
- *OPERATIONS AND SUPPORT PHASE* - CI (s) OPERATIONAL LIFE CYCLE

8-5265

CONFIGURATION CONTROL

PURPOSE:

- PROVIDES MANAGEMENT VISIBILITY
- PREVENTS UNNECESSARY OR MARGINAL CHANGES
- ESTABLISHES CHANGE PRIORITIES
- ASSURES PROMPT ACTION

8-5265

KINDS OF CHANGES

- ENGINEERING CHANGE PROPOSALS
- REQUEST FOR DEVIATION
- REQUEST FOR WAIVER
- CONTRACT CHANGE PROPOSALS
- ADVANCED CHANGE/STUDY NOTICE

8-5265

CONFIGURATION CHANGE CONTROL

- ENGINEERING CHANGE PROPOSALS
  - PERMANENT BASELINE CHANGE
  - NEW CONFIGURATION PREFERRED
- DEVIATIONS/WAIVERS
  - TEMPORARY BASELINE CHANGE
  - DOCUMENTED CONFIGURATION PREFERRED
- CONTRACT CHANGE PROPOSALS
  - NO BASELINE IMPACT, JUST CONTRACT SCOPE
- ADVANCED CHANGE/STUDY NOTICE
  - PRELIMINARY LOOK AT CHANGE IDEAS

8-5265

ENGINEERING CHANGE PROPOSAL

- PERMANENT BASELINE CHANGE
  - FUNCTIONAL - SYSTEM REQUIREMENTS
  - ALLOCATED - CONFIGURATION ITEM REQUIREMENTS
  - PRODUCT - CONFIGURATION ITEM DESIGN

- CHANGE BASELINE AND CONTACT
  - MANY RELATED TASKS/DATA DELIVERIES

- MIL-STD-480B/481B DETAILS CONTENT
  - MIL-STD-483 APPENDIXES SUPPLEMENT-480
  - CLARIFY REQUIRMENTS WITH CONTRACTOR

8-5265

CLASS II ENGINEERING CHANGES

- AFFECT PRODUCT BASELINE ONLY
  - DRAWINGS, PARTS LISTS
  - SOFTWARE LISTING
- NO INTERCHANGEABILITY IMPACT
- PLANT REPRESENTATIVE REVIEWS
  - NORMALLY CONCURS/NONCONCURS
  - APPROVAL REQUIRES SPECIAL CONTRACT TERMS
- PROGRAM OFFICE SELDOM REVIEWS
  - LARGE NUMBERS/LOW CRITICALITY

8-5265

REQUEST FOR DEVIATION/WAIVER

- TEMPORARY BASELINE DEPARTURE
  - AFFECTS DESIGN AND/OR PERFORMANCE
  - BASELINE IS PREFERRED
  - WILL WE ACCEPT AN ALTERNATE?
  - NO IMPACT ON SUPPORT ELEMENTS
- PERMANENT FOR UNITS AFFECTED
  - NO FOLLOW-UP OR CORRECTION REQUIRED
- "CONSIDERATION" REQUIRED - FAR
  - GOVERNMENT ACCEPTS "NONCONFORMING" UNIT

8-5265

CONTRACT CHANGE PROPOSAL

- NO IMPACT ON BASELINES

- CHANGE CONTRACT TASKING/DATA
  - STATEMENT OF WORK TASKS
  - CONTRACTUALLY BINDING PLANS
  - CONTRACT DATA REQUIREMENTS LIST
  - TAILORING OF MANAGEMENT STANDARDS

- SKETCHY OUTLINE OF CONTENT
  - MIL-STD-483 TASKING
  - DATA ITEM INCLUDES SAMPLE FORMAT
  - WORK OUT DETAILS WITH CONTRACTOR

8-5265

ADVANCED CHANGE/STUDY NOTICE

- DISCUSS A CHANGE POSSIBILITY
  - IDENTIFY DOCUMENTS AFFECTED
  - IDENTIFY POSSIBLE ALTERNATIVES
  - ESTIMATE SCOPE OF CHANGE REPORT
  - ESTIMATE ROUGH MAGNITUDE OF COST
  - ASSESS DESIRABILITY, PREFERENCES

- DO WE WANT A FORMAL PROPOSAL?
  - YES - ALTERNATIVE/SCOPE ALREADY REFINED
  - NO - AVOIDED HIGH PREPARATION COSTS

8-5265

CHANGE MANAGEMENT PHILOSOPHY

- ALL INFORMATION PROVIDED
- ALL FUNCTIONS HAVE REVIEWED
- ALL CONCERNS ADDRESSED
- DECISIONMAKER INFORMED

* DELIBERATE, INFORMED DECISIONS

8-5265

CONFIGURATION CONTROL BOARDS (CCB)

- ESTABLISHED BY DOD COMPONENTS PER DODD 5010.19
  - REVIEW PROPOSED CHANGES
  - OFFICIAL BOARD FOR APPROVAL/ DISAPPROVAL

8-5265

CONTRACTUAL AUTHORIZATION

- WAIT FOR CONTRACT MODIFICATION
  - NEGOTIATED SUPPLEMENTAL AGREEMENT
  - UNILATERAL CHANGE ORDER
- LEGITIMATE EXCEPTIONS
  - ADVANCED RELEASE - CONTRACTOR RISK
  - COMPATIBILITY ECP - SOME GOVERNMENT RISK
- RISKY WORKAROUNDS
  - INFORMATIONAL LETTERS/STATUS REPORTS
  - USE DEVIATION FOR ACCEPTANCE

8-5265

CONFIGURATION STATUS ACCOUNTING

CONFIGURATION STATUS ACCOUNTING IS THE RECORDING AND REPORTING OF THE INFORMATION THAT IS NEEDED TO MANAGE CONFIGURATION EFFECTIVELY, INCLUDING A LISTING OF THE APPROVED CONFIGURATION IDENTIFICATION, THE STATUS OF PROPOSED CHANGES, WAIVERS, AND DEVIATIONS TO THE CONFIGURATION, AND THE IMPLEMENTATION STATUS OF APPROVED CHANGES.

8-5265

CONFIGURATION STATUS ACCOUNTING

- BASELINE/CHANGE TRACEABILITY
  - ACCURATE, CURRENT INFORMATION
  - COMPLETE HISTORICAL INFORMATION

- MANAGEMENT INFORMATION SYSTEM
  - FLEXIBLE REQUIREMENTS
  - TAILOR TO PROGRAM SIZE/NEEDS
  - CONTRACTOR'S EXISTING SYSTEM PREFERRED

- STANDARDIZE DATA ELEMENTS
  - USE MIL-STD-482 DATA ELEMENTS
  - PROVIDE GUIDE TO DATA ELEMENTS

8-5265

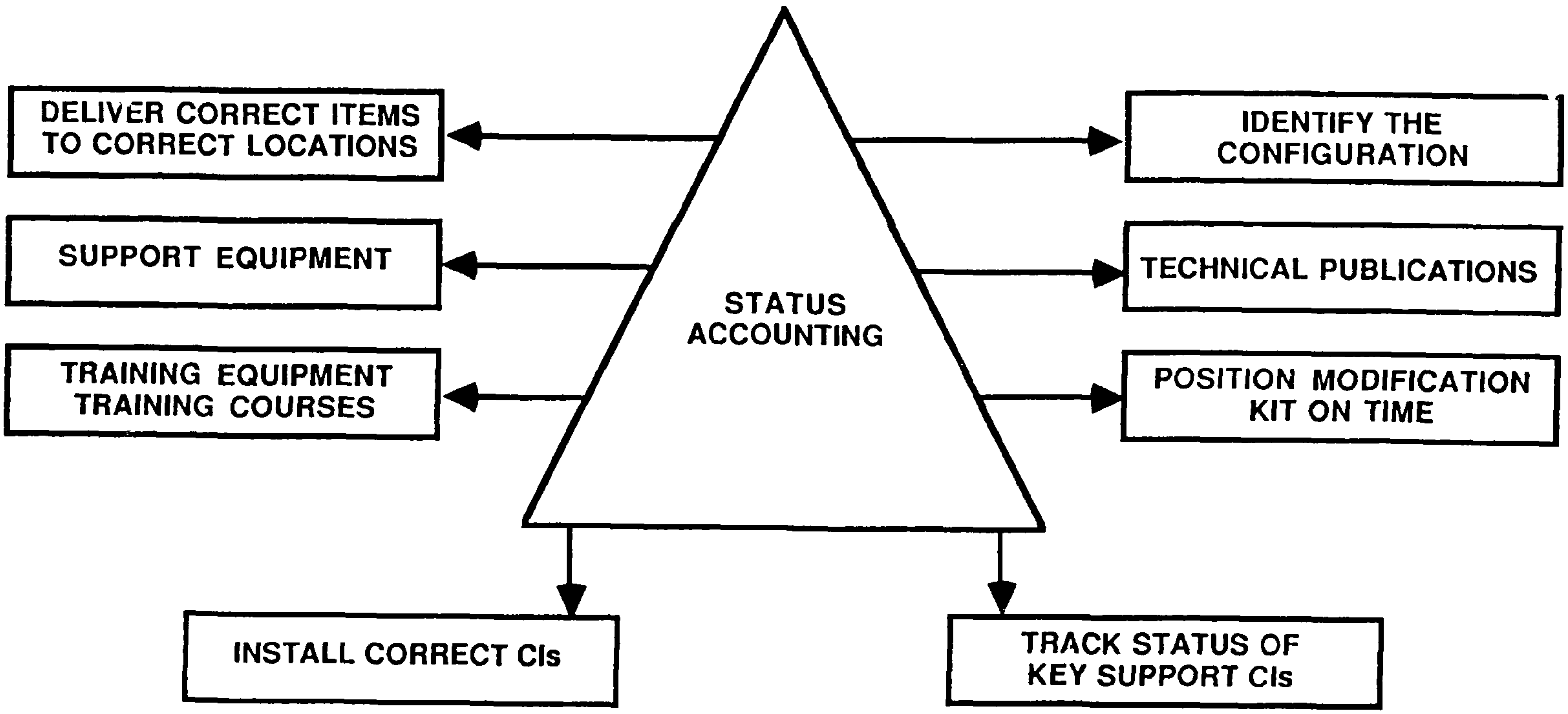
CONFIGURATION STATUS ACCOUNTING

- IDENTIFY DOCUMENTS AND ITEMS
  - BASELINES (SPECS, DRAWINGS, LISTING)
  - IDENTIFICATION NUMBERS, SERIAL NUMBER
- IDENTIFY CONTRACT INFORMATION
  - CONTRACT NUMBER, CONTRACTOR'S FSCM
- TRACK PROPOSAL PROCESSING
  - MANAGE PROCESSING EVENTS
- TRACK APPROVED CHANGES
  - RECORD OF CHANGE EFFECTIVITIES
  - IMPLEMENTATION STATUS
- TRACK OPERATIONAL CONFIGURATION
  - MAINTENANCE, RETROFIT/MODIFICATION

8-5265

WHY STATUS ACCOUNTING?

STATUS ACCOUNTING HELPS:



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CONFIGURATION STATUS ACCOUNTING

PROVIDES

MANAGERS

FEEDBACK INFORMATION TO:

- MONITOR IMPLEMENTATION OF CCB DIRECTIVES
- IDENTIFY CURRENT CONFIGURATION IDENTIFICATION
- MONITOR CHANGE STATUS
- EVALUATE EFFECTIVENESS ANALYSIS
- REVIEW CONFIGURATION CHANGE IMPLEMENTATION STATUS REPORTS

USERS

HISTORICAL AND PRESENT INFORMATION CONCERNING THE CONFIGURATION, VERSION, AND PROPOSED CHANGES TO THE CI

8-4265

CONFIGURATION MANAGEMENT PLAN

- PURPOSE
- APPLICATION
- INTERFACE AGREEMENT
- OBJECTIVES OF PLANNING
- OBJECTIVES OF DOCUMENTATION
- IMPLEMENTATION
- CM ELEMENTS

8-5265

OBJECTIVES OF CONFIGURATION MANAGEMENT

- PROVIDE A CONFIGURATION THAT IS:
  - DETERMINED DURING DESIGN/DEVELOPMENT
  - MAINTAINED THROUGHOUT THE LIFE CYCLE
  - SUPPORTABLE DURING PRODUCTION/DEPLOYMENT AND AND OPERATIONAL/SUPPORT PHASES
  - CONTROLLED AT AFFORDABLE LIFE CYCLE COST

- CONCENTRATE ON LOGISTIC ELEMENT/TECHNICAL INTERRELATIONSHIP
  - SPECIFICATIONS, ENGINEERING DRAWINGS, LOGIC DIAGRAMS, AND PROGRAM DESCRIPTIONS DOCUMENTS, ETC
  - STANDARDIZATION AND COMPATIBILITY MAINTAINED
  - CONTROL SYSTEM, EQUIPMENT, AND COMPUTER PROGRAM INTERFACES
  - MAINTAIN CURRENT CONFIGURATION STATUS BY CONFIGURATION ITEM

8-5265

WHY DO WE NEED CM?

- PERMIT ORDERLY DEVELOPMENT OF A CI
- CONTROL CHANGES
- ELIMINATE RISKS
- CONTROL COSTS
- ENSURE COMBINED OPERATIONS COMPATIBILITY AND OPERABILITY

8-5265

WHY DO WE NEED CM?

- DOD NEEDS AN EFFECTIVE MANAGEMENT AND COMMUNICATIONS TOOL
  - DATA = REQUIREMENTS
  - PEOPLE USE CORRECT DATA
  - PRODUCTS MEET REQUIREMENTS
  - DELIVER AT LOWEST COST

8-5265

WHY DO WE NEED CM?

- IF WE USE THIS TOOL, WE KNOW WHAT -
  - WE ARE SUPPOSED TO BUILD
  - WE ARE BUILDING
  - WE HAVE BUILT

WE CAN THEN SUPPORT IT

8-5265

APPLICATION OF CONFIGURATION MANAGEMENT

TAILORED IN ACCORDANCE WITH DODD 5000.43

- COMPLEXITY
- SIZE
- QUANTITY
- MISSION CRITICALITY

8-5265

CONFIGURATION MANAGEMENT ADVISORY GROUP (CMAG)

- ESTABLISHED PER DODD 5010.19
- REPRESENTATIVE FROM EACH DOD COMPONENT
- PROVIDES GUIDANCE AND COMMENTS TO DOD ACQUISITION PROGRAM AUTHORITIES ON CM APPLICATION

8-5265

CMAG FOCAL POINTS

CHAIRMAN - LINDA BURGHER
DDMO, 756-2554

MEMBERS - MAJOR KOPALA
SAF/AQXA, 695-2371

ROBERT HIEBERT
AMC (AMPCD-SE) 274-6748

JIM ENSMINGER
OPNAV, CODE 431C 695-5033

TIM PARKER
U.S. MARINE COIRPS (PSI-G) 694-2606

ROBERT MIRCHEFF
DLA (QEL) 274-7141

8-5265

STANDARDIZATION – WHAT, NOT HOW-TO

MILITARY & COMMERCIAL

B. A. HARDESTY

22 AUGUST 1988

GH88-1131.50-D

I AM DELIGHTED TO BE WITH THIS MAGNIFICENT AUDIENCE OF 380 KEY INDIVIDUALS AND I THANK YOU FOR THIS OPPORTUNITY TO OFFER MY RECOMMENDATIONS TO IMPROVE THE DoD STANDARDIZATION PROGRAM.

I ENTHUSIASTICALLY COMPLIMENT PETE YURCISIN AND HIS STANDARDIZATION TEAM INCLUDING ANDY CERTO, LEE ROGERS, STEVE LOWELL, CARL BERRY, AND JACK WYATT FOR PUTTING TOEGTHER THIS FINE PROGRAM AT THIS TIME.

THE PRIMARY SUBJECTS THAT WILL BE DISCUSSED FOR THE NEXT 3 DAYS . . . STANDARDIZATION, ACQUISITION STREAMLINING, AND TOTAL QUALITY MANAGEMENT . . . AND THEIR PROPER IMPLEMENTATION . . . ARE CRUCIAL TO PROVIDING THE NATION MORE DEFENSE PER DOLLAR . . . THAT'S REAL PRODUCTIVITY . . . AND TO PROVIDING OUR MILITARY MEN AND WOMEN TOP QUALITY PRODUCTS.

JUST 3 MONTHS AGO, AND AS REPORTED IN THE JULY ISSUE OF THE DoD STANDARDIZATION NEWSLETTER, DR. W. EDWARDS DEMING DISCUSSED QUALITY PRINCIPLES WITH 420 SENIOR LEVEL DoD MANAGERS. AT THE BEGINNING OF THE SEMINAR, DR. DEMING STATED THAT MASS PRODUCTION WAS ONE OF THE MAJOR U.S. CONTRIBUTIONS TO THE WORLD. IN HIS BOOK, "OUT OF THE CRISIS," DR. DEMING ENDORSED SENATOR RALPH FLANDERS' 1951 STATEMENT THAT "AMERICAN MASS PRODUCTION, MADE POSSIBLE BY STANDARDIZATION, WAS OUR NUMBER-ONE WEAPON IN WW II."

DR. DEMING WENT ON TO EMPHASIZE THE IMPORTANCE OF GETTING INDUSTRY INVOLVED IN THE PREPARATION OF STANDARDS AND TO ENCOURAGE DOD TO INCREASE THE USE OF VOLUNTARY (CONSENSUS) STANDARDS.

I AGREE WITH BOTH THE SENATOR AND DR. DEMING. STANDARDIZATION WAS VITAL DURING WW II AND IT IS VITAL TODAY. VOLUNTARY CONSENSUS IS ALSO VITAL.

UNFORTUNATELY, IN THE 1960'S DOD STARTED TWO COUNTERPRODUCTIVE PRACTICES WHICH:

A. ARE DIFFERENT THAN WW II MILITARY PRACTICES.
B. ARE DIFFERENT THAN COMMERCIAL PRACTICES THEN.
C. ARE DIFFERENT THAN COMMERCIAL PRACTICES NOW.
D. INCREASED THE COST OF DEFENSE FOR MORE THAN 20 YEARS.
E. CAUSED MANY TO HAVE LESS RESPECT FOR DOD STANDARDIZATION.

WHAT ARE THESE TERRIBLY COSTLY DIFFERENCES? FIRST LET'S CONSIDER THE PREMATURE CONTRACTUAL APPLICATION OF MIL-SPECS, MIL-STANDARDS, AND DETAIL DESIGN SOLUTIONS.

BEFORE THE 1960'S, FULL SCALE DEVELOPMENT (FSD) OF WEAPON SYSTEMS BEGAN WITH 1 OR 2 PAGES OF SYSTEM LEVEL MISSION PERFORMANCE REQUIREMENTS . . . THAT WAS IT! NO PREMATURE DESIGN SOLUTIONS . . . NO MIL-SPECS PRIOR TO FSD. SURE MIL-SPECS WERE USED. THEY WERE SELECTED DURING FSD. THE PURPOSE OF FSD WAS UNDERSTOOD. THE PURPOSE IS TO GAIN THE KNOWLEDGE (THROUGH ANALYSES, TRADEOFFS, AND TESTING) NECESSARY TO SELECT AND TAILOR THE SYSTEM PECULIAR AND MIL-SPECS NEEDED FOR THE PRODUCTION PHASE . . . THIS IS STILL THE COMMERCIAL WAY!

THE SECOND UNFORTUNATE PRACTICE WAS INTRODUCED ALMOST SIMULTANEOUSLY. DoD STARTED TRYING TO STANDARDIZE CONTRACTOR'S MANAGEMENT SYSTEMS. MANAGEMENT SYSTEMS ARE GOOD AND NECESSARY. STANDARDIZING AND CONTRACTUALLY MANDATING MANAGEMENT SYSTEMS ARE BAD.

IT IS ALWAYS IMPRACTICAL AND COSTLY . . . IF NOT IMPOSSIBLE . . . TO STANDARDIZE HOW-TO-MANAGE. EVERY MAJOR PROGRAM IS DIFFERENT. EACH HAS DIFFERENT OBJECTIVES, PROBLEMS, AND SOLUTIONS. EVERY CONTRACTOR IS DIFFERENT. EACH HAS DIFFERENT ORGANIZATIONS, STRENGTHS AND WEAKNESSES. MANAGEMENT SYSTEMS . . . TO BE EFFECTIVE AND EFFICIENT . . . MUST BE TAILORED TO INDIVIDUAL PROGRAMS AND THE MANAGERS USING THEM.

PREMATURE TECHNICAL SPECIFICATIONS AND HOW-TO-MANAGE REQUIREMENTS HAVE SIGNIFICANTLY CONTRIBUTED TO THE COST OF DEFENSE. FOR EXAMPLE, BEFORE, DURING, AND LONG AFTER WW II, THE ACQUISITION COST PER POUND OF MILITARY AIRCRAFT WAS LESS THAN THAT OF COMMERCIAL AIRCRAFT. BY 1965 IT HAD MORE THAN DOUBLED. BY ABOUT 1970, THE COST PER POUND OF MILITARY AIRCRAFT GREW TO ABOUT 3 TIMES THAT OF COMMERCIAL AIRCRAFT. BY 1975 IT GREW TO ABOUT 4 TIMES THE COMMERCIAL COST PER POUND BEFORE THE GROWTH SLOWED.

FOR AT LEAST 23 YEARS, PREMATURE TECHNICAL SPECS AND HOW-TO-MANAGE RFP AND CONTRACT REQUIREMENTS HAVE ALSO HURT OVERALL DoD STANDARDIZATION EFFORTS. THEY HAVE CAUSED CYNICISM AND SKEPTICISM. THE GOOD NEWS IS SOME PROGRESS HAS BEEN MADE CONCERNING PREMATURE SPECIFICATIONS. THE BAD NEWS IS VERY LITTLE HAS BEEN DONE TO STOP THE GENERATION AND APPLICATION OF HOW-TO-MANAGE REQUIREMENTS.

THAT'S THE PRIMARY REASON I'M HERE TODAY. THAT'S WHY I'M GOING TO SHOW YOU SOME SLIDES WHICH FURTHER ILLUSTRATE THE HOW-TO-MANAGE PROBLEM AND WHAT SHOULD AND CAN BE DONE ABOUT IT.

PRESIDENT'S BLUE RIBBON DEFENSE PANEL
1970

IT WAS INTERESTING TO NOTE THAT IN EARLY 1966 BOTH INDUSTRY AND THE DoD HAD INDEPENDENTLY ARRIVED AT THE SAME IDENTIFICATION OF THE PROBLEM . . . GREAT PROLIFERATION OF MANAGEMENT SYSTEMS COMING AT US FROM MANY DIRECTIONS AT AN EVER INCREASING RATE.

GH88-1131.051-M

OVER FIFTY PROGRAM MANAGERS 1972 AND 1973

- OSD
- AIRCRAFT
- ELECTRONICS
- SHIPBUILDING
- SERVICES
- SMALL ARMS
- SPACE
- ENGINES

GH82-1088.32

PROBLEMS MOST OFTEN MENTIONED

- PREMATURELY SELECTED DETAIL SPECIFICATIONS
- EXTERNALLY IMPOSED MANAGEMENT SYSTEMS WHICH INTERFERED WITH NORMAL ENGINEERING ITERATIVE PROCESSES

GH82 066 24

SUCCESSFUL DEVELOPMENT DEPENDS PRIMARILY UPON

- COMPETENT PEOPLE WITH APPROPRIATE AUTHORITY
- REALISTIC OBJECTIVES
- RESOLUTION OF RISK
- CANDID COMMUNICATION
- MOTIVATION
- FLEXIBILITY
- RECOGNITION THAT ALL DEVELOPMENT PROGRAMS ARE DIFFERENT

GH87-1020.5

DAVID PACKARD — 1973

MANAGEMENT SYSTEMS...THE PRINCIPLE HERE SHOULD BE THAT THE DoD SHOULD NOT HAVE TO SPECIFY THE MANAGEMENT SYSTEM FOR THE CONTRACTOR. IF THE CONTRACTOR DOES NOT HAVE A MANAGEMENT SYSTEM ADEQUATE TO MANAGE A PROGRAM, HE SHOULD NOT BE GIVEN THE CONTRACT. ON THIS POINT HIS PAST RECORD SHOULD BE THE MOST IMPORTANT CRITERIA. THIS IS A MUCH BETTER MEASURE THAN WHETHER HE MEETS SOME OF THE MANAGEMENT SYSTEM SPECIFICATIONS THAT HAVE BEEN DREAMED UP.

GH88-1102.2

HEWLETT-PACKARD COMPANY
1501 PAGE MILL ROAD
PALO ALTO, CALIFORNIA 94304

DAVID PACKARD
CHAIRMAN OF THE BOARD

April 6, 1973

Mr. Brent A. Hardesty
Corporate Director
Engineering & Research Staff
McDonnell Douglas Corporation
P O Box 516
St. Louis, Mo. 63166

Dear Brent:

I have looked over your proposed directive on the Development of Major Defense Systems. I think it is a good job and I have only one or two suggestions.

I am convinced that the most important step to improve the management of defense programs is to select a capable Program Manager and give him some real authority. I think you have recognized this in your directive, but I believe this matter should be further defined. I believe the Program Manager must have authority over the Contracting Officer. He must have authority over the Defense Contract Audit Agency in the sense that DCAA is only advisory to him and he can override their recommendations. Both the Contracting Officer and the DCAA should be, in effect, elements of his personal staff to give him professional advice in regard to a proposed action, but his judgment should prevail in all areas relating to the management of the program.

You will have some trouble getting this concept accepted, but I will talk to the Secretary and the Deputy Secretary about it to help get their support.

The other matter of concern has to do with management systems. I believe the principle here should be that the DOD should not have to specify the management system for the contractor. If the contractor does not have a management system adequate to manage a program, he should not be given the contract. On this point his

Mr. Brent A. Hardesty April 6, 1973
Page 2.

past record should be the most important criteria. This if a much better measure than whether he meets some of the management system specifications that have been dreamed up by DOD.

Again, let me say I think you have done a good job and I will try to help with support at the Secretaries level.

Sincerely,

David Packard

DP/mmp

DoDD 5000.19 "Policies for the Management and Control of Information Requirements"

1976

". . . THE DoD SHALL SPECIFY ITS REQUIREMENTS IN TERMS OF OUTPUTS OR SYSTEM CAPABILITIES (WHAT IS REQUIRED) RATHER THAN DETAILED PROCEDURES OR METHODS OF ACCOMPLISHMENT (HOW TO ACHIEVE) . . ."

DSB SHEA TASK FORCE
1977

DoD SPECIFICATIONS AND STANDARDS

- ARE ESSENTIAL TO TECHNICAL PROCUREMENT
- ARE . . . AS A BODY . . . ADEQUATE
- PROVIDE LESSONS LEARNED
- SERVE AS PRIMERS FOR THE INEXPERIENCED
- HELP ASSURE QUALITY PRODUCTS

HOWEVER THEY

- INCLUDE COST DRIVERS . . . PRIMARILY NON PRODUCT . . . THOSE CONCERNING GENERAL DESIGN REQUIREMENTS, DOCUMENTATION AND MANAGEMENT
- REFER TO OTHER DOCUMENTS . . . MANY OF WHICH SHOULD NOT BE CONTRACTUAL

WHAT'S NEEDED

- IMPROVE THE SPECIFICATIONS AND STANDARDS THEMSELVES
- IMPROVE APPLICATION OF SPECIFICATIONS AND STANDARDS

GH85-1126.10

DSB HARDESTY TASK FORCE
1979

DR. RICHARD DELAUER:

SPECIFY WHAT, NOT HOW – THE DSB HARDESTY TASK GROUP HAS REPEATEDLY RECOMMENDED THAT DOD SHOULD SPECIFY, BOTH IN RFPs AND IN CONTRACTS, WHAT IT NEEDS RATHER THAN HOW TO ACCOMPLISH IT. THE DRAFT OF 5000.1 IS SILENT ON THIS VITAL PRINCIPLE, WHILE THE 5000.2 DRAFT TOUCHES ON THIS CONCEPT ONLY LIGHTLY AND INADEQUATELY, IN OUR VIEW.

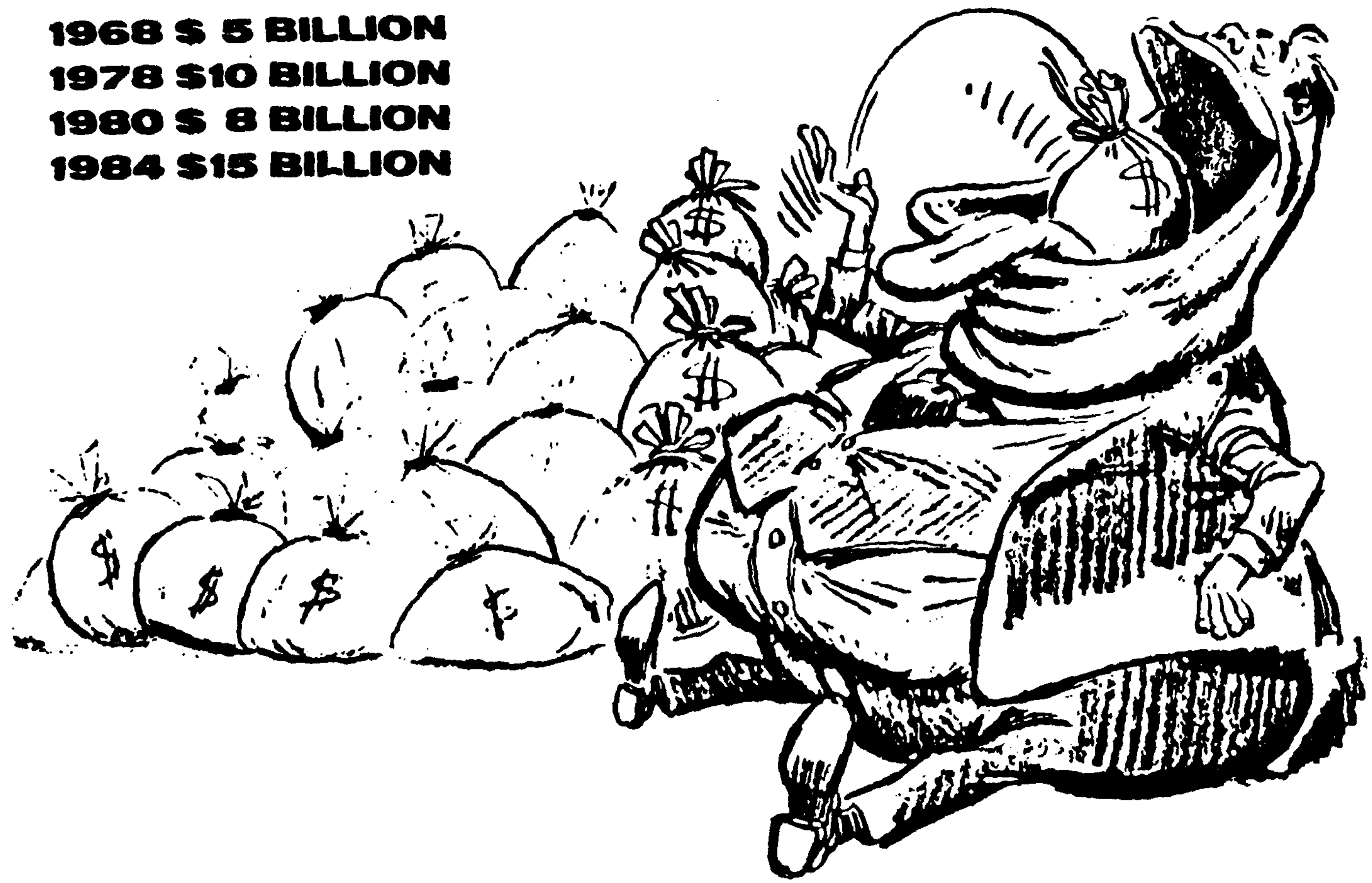
GH86-1102.4

DEPSECDEF CARLUCCI — 1981

"ONE BIG AREA IN WHICH WE BELIEVE COSTS MAY BE SIGNIFICANTLY REDUCED IS GOVERNMENT PARTICIPATION IN THE CONTRACTOR'S INTERNAL MANAGEMENT"

GH83 1079 47

1968 $ 5 BILLION
1978 $10 BILLION
1980 $ 8 BILLION
1984 $15 BILLION



HOW-TO-ADDICT

GH84-1082.5

HOW-TO
REQUIREMENTS ARE COUNTERPRODUCTIVE

STUDY OF 108 GOVERNMENT R&D PROJECTS CONCLUDES: "THE APPLICATION OF A LARGE VOLUME AND VARIETY OF MANAGEMENT CONTROL TECHNIQUES TO R&D PROJECTS TENDS TO BE ASSOCIATED WITH GREATER NUMBERS OF TECHNICAL, SCHEDULE, AND COST FAILURES THAN WERE ASSOCIATED WITH PROJECTS NOT HAVING SUCH CONTROL."

GH85-1128.2

POLICIES

DoDD 5000.43

1. PROMOTE INNOVATIVE AND COST-EFFECTIVE ACQUISITION STRATEGIES.
2. ENCOURAGE ACQUISITION ACTIVITIES AND CONTRACTORS TO STREAMLINE RFPs AND CONTRACTS.
3. AVOID PREMATURE APPLICATION OF DESIGN SOLUTIONS.
4. SPECIFY SYSTEM LEVEL MISSION PERFORMANCE REQUIREMENTS AT ONSET OF DEVELOPMENT.
5. ENCOURAGE CONTRACTORS TO CRITIQUE DRAFT RFPs.
6. SPECIFY WHAT IS NEEDED, RATHER THAN HOW-TO.

GH88-1152.8

POLICIES (Continued)

7. PRECLUDE PREMATURE APPLICATION OF DoD-SPECS AND DoD-STANDARDS.
   - PRIOR TO FSD – GUIDANCE ONLY
   - IF PERTINENT, TAILOR FOR FSD
8. LIMIT CONTRACTUAL APPLICABILITY OF REFERENCES.
   - PRIOR TO FSD – NONE, GUIDANCE ONLY
   - ONSET OF FSD – ONE TIER
   - FOR PRODUCTION – AS TAILORED
9. REQUIRE CONTRACTORS TO TAILOR DURING ONE PHASE FOR APPLICATION TO THE NEXT.
10. ASSIGN AUTHORITY AND ACCOUNTABILITY FOR DETERMINING REQUIREMENTS TO GOVERNMENT PM.

GH86-1152.8a

ACQUISITION STREAMLINING POLICIES

DODD 5000.43 ENDORSED BY

- ARMY
- NAVY
- AIR FORCE
- 22 OSD OFFICES
- 800 + CONTRACTORS
- PACKARD COMMISSION
- SHIPBUILDERS COUNCIL OF AMERICA
- AEROSPACE INDUSTRIES ASSOCIATION
- ELECTRONIC INDUSTRIES ASSOCIATION
- NATIONAL SECURITY INDUSTRIAL ASSOCIATION
- COUNCIL OF DEFENSE AND SPACE INDUSTRY ASSOCIATIONS
- FIVE "DoD MANUFACTURING IMPROVEMENT STRATEGIES" COMMITTEES
- DEFENSE ACQUISITION REGULATORY COUNCIL (DARC)
- CIVILIAN AGENCY ACQUISITION COUNCIL (CAAC)

GH88-1172.7

DSB BURNETT & PERRY TASK FORCE 1986

- USE OF COMMERCIAL PRODUCTS SHOULD RESULT IN LARGE ANNUAL SAVINGS
- SAVINGS THRU USE OF COMMERCIAL PRACTICES FOR MILITARY PRODUCTS SHOULD BE EVEN GREATER

GH88-1131.52-D

COMPARISON OF DoD AND COMMERCIAL REQUIREMENTS

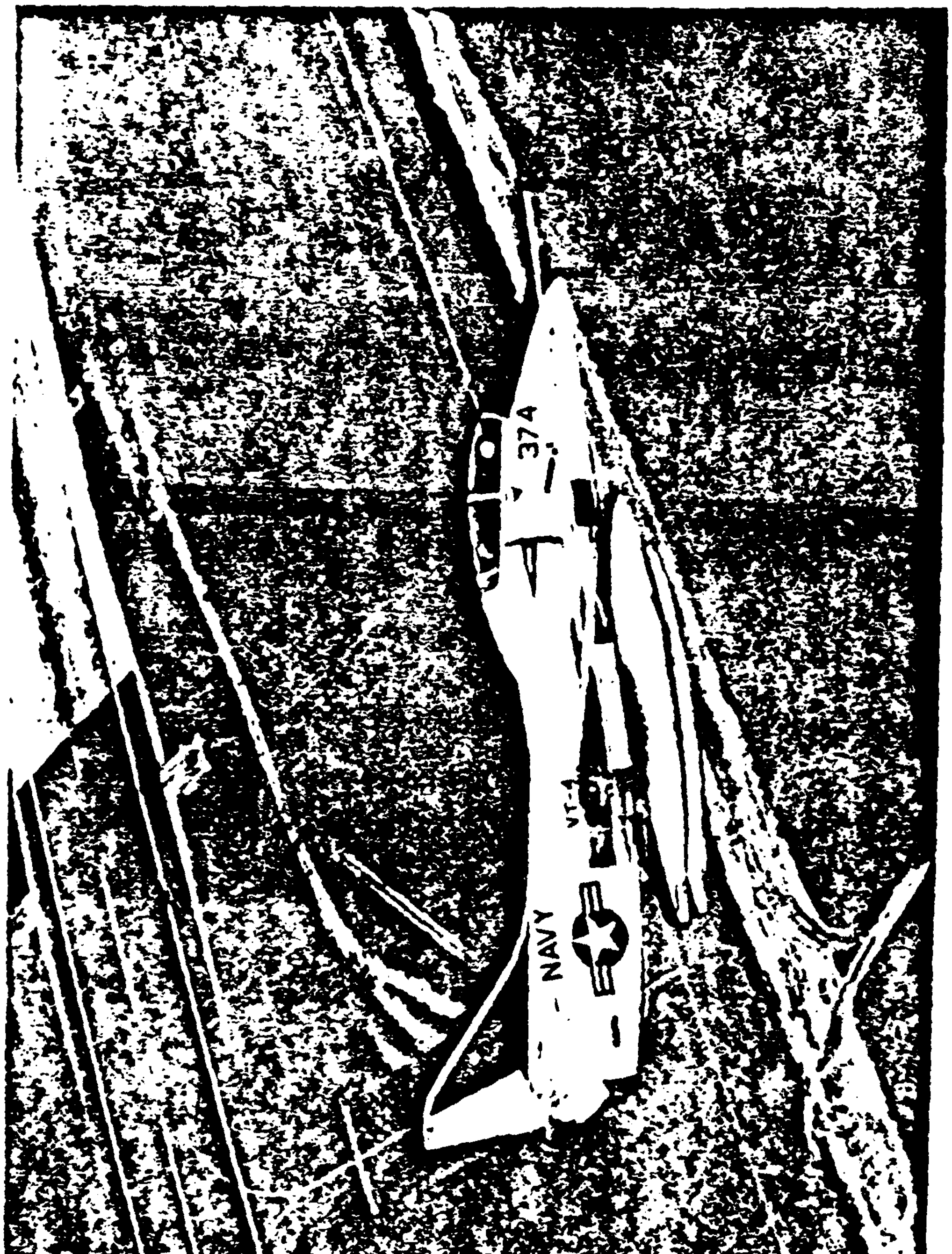
FSD CONTRACTUAL REQUIREMENTS	DoD WITHOUT STREAMLINING	COMMERCIAL
PROGRAM PLANS		
MANAGEMENT SYSTEMS	30	0
OTHER THAN MANAGEMENT SYSTEMS	20	1
SPECIFICATIONS	350	9
DATA ITEM DESCRIPTIONS	400	0
DOCUMENTS — ORIGINAL CALLOUT	800	10
TOTAL DOCUMENTS — INCLUDING TWO TIERS OF REFERENCED DOCUMENTS	24,000	50
PAGES OF SYSTEM PECULIAR SPECS	16,000	400

GH87-1028.3

COMMERCIAL BUYERS DO NOT SPECIFY HOW-TO-MANAGE

BUYER	CONTRACTOR	SALE (W/OPTIONS)
ILFC	BOEING	$4.6 BILLION
BRITISH INTERNATIONAL	BOEING	4.1
AMERICAN	BOEING	4.X
SINGAPORE INTERNATIONAL	BOEING	3.3
AMERICAN	MCDONNELL DOUGLAS	3.2
UNITED	BOEING	3.0
UNITED	BOEING	2.7
GPA	MCDONNELL DOUGLAS	2.3
DELTA	MCDONNELL DOUGLAS	2.0

GH88-1085.22-D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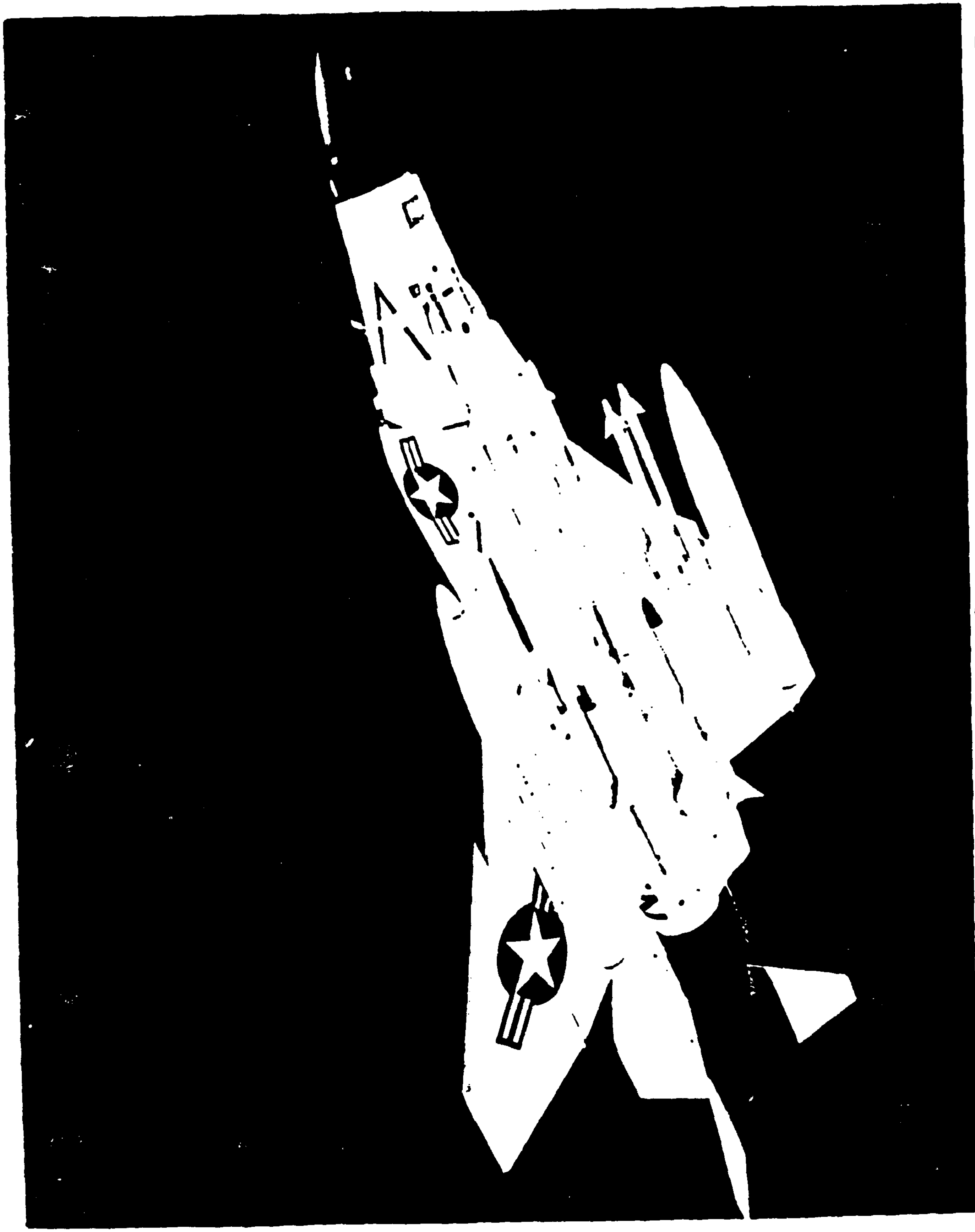
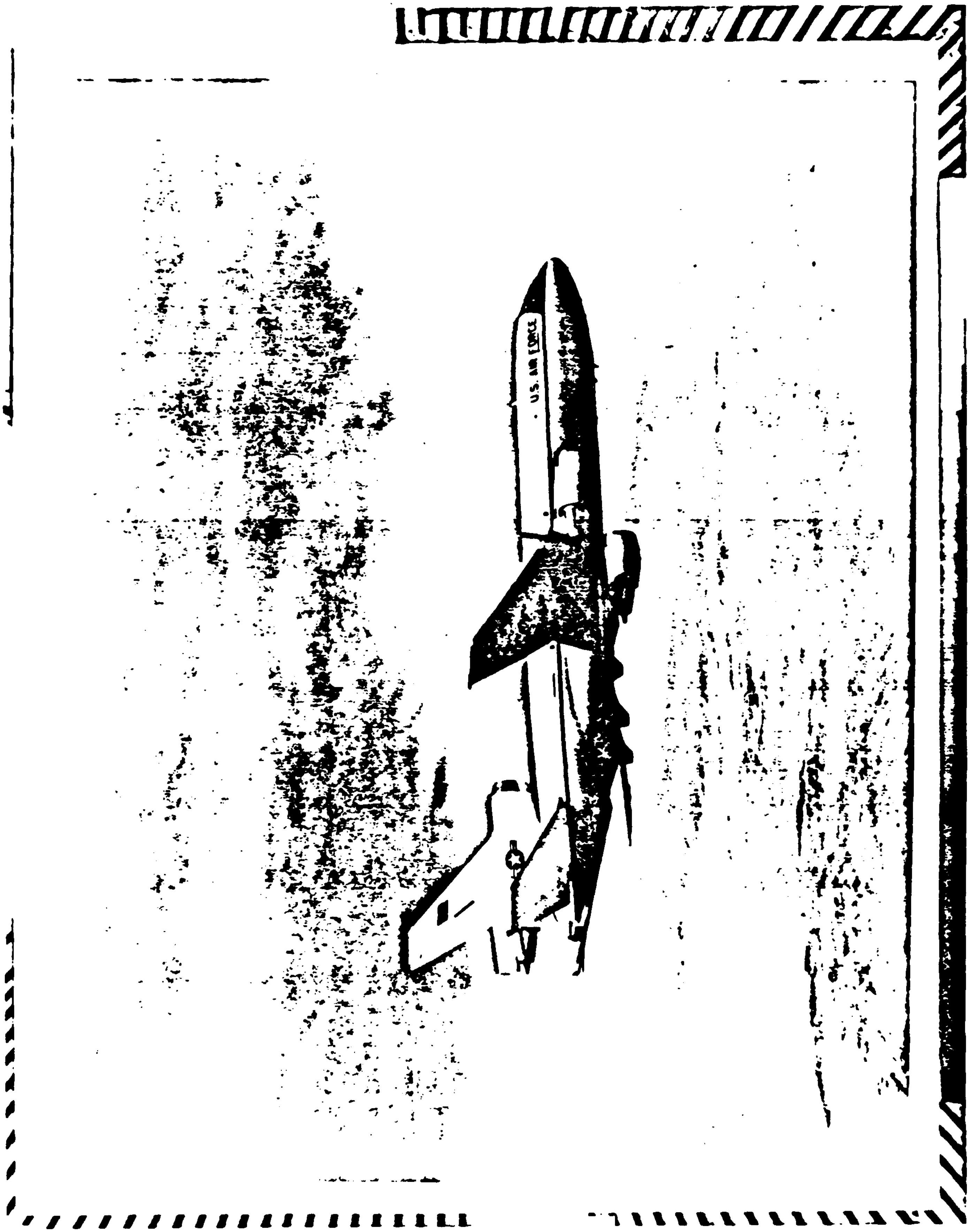
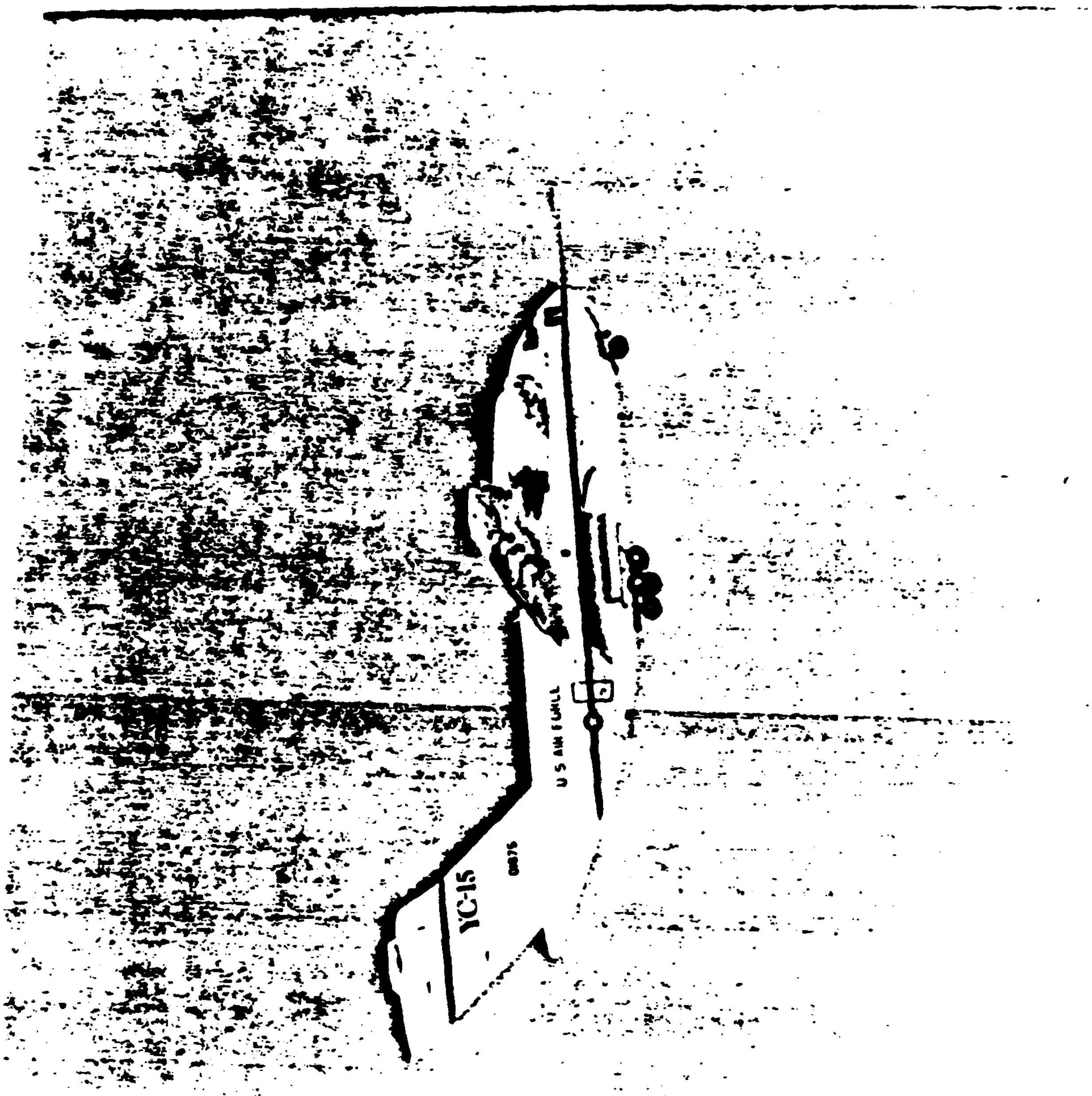
NAVY




U.S. AIR FORCE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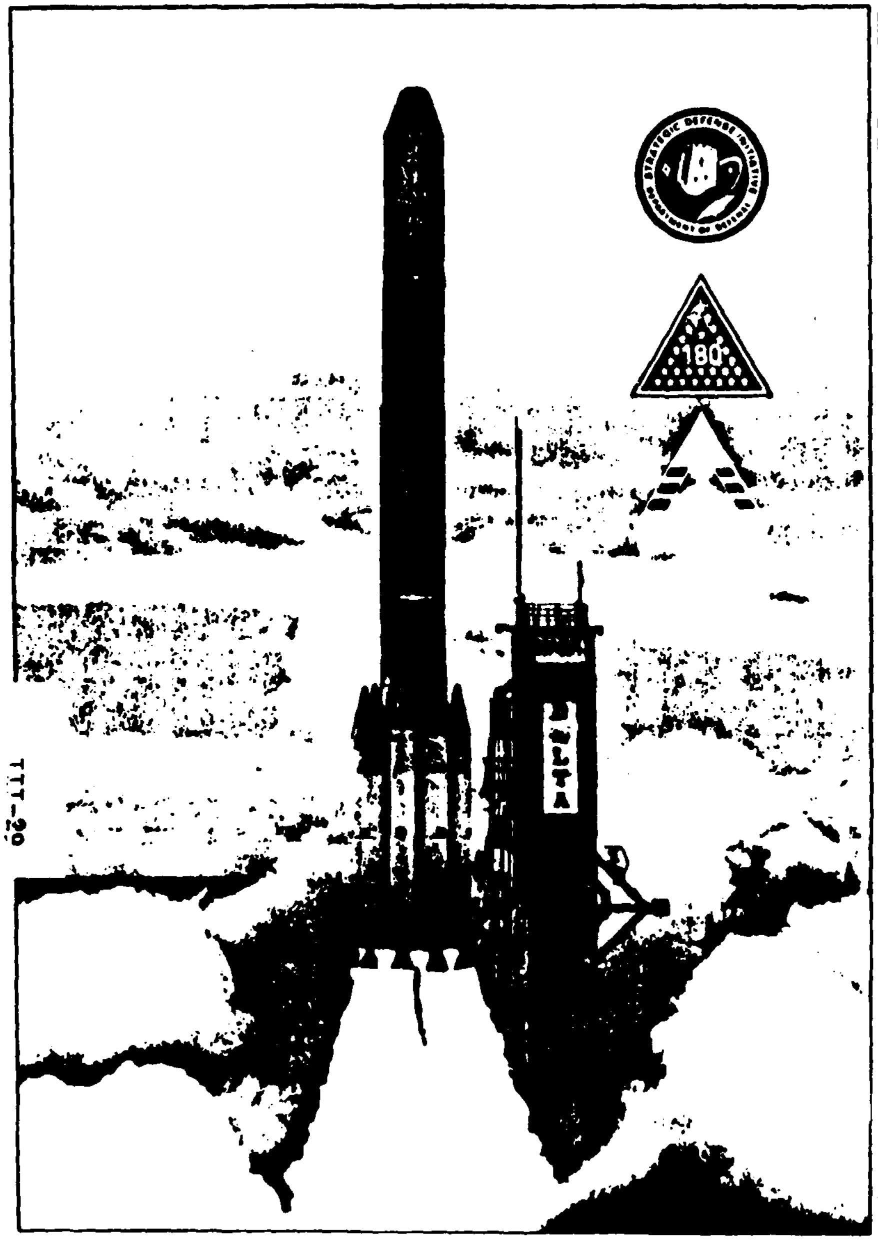


TTT-29

FIRST LASER
RADAR IN SPACE

STREAMLINING THE DELTA 180

General Abrahamson: "The most complex command and control mission that the United States has ever conducted."

BUSINESS AS USUAL

36-60 MONTHS

$400-500 MILLION

ACTUALS AFTER STREAMLINING

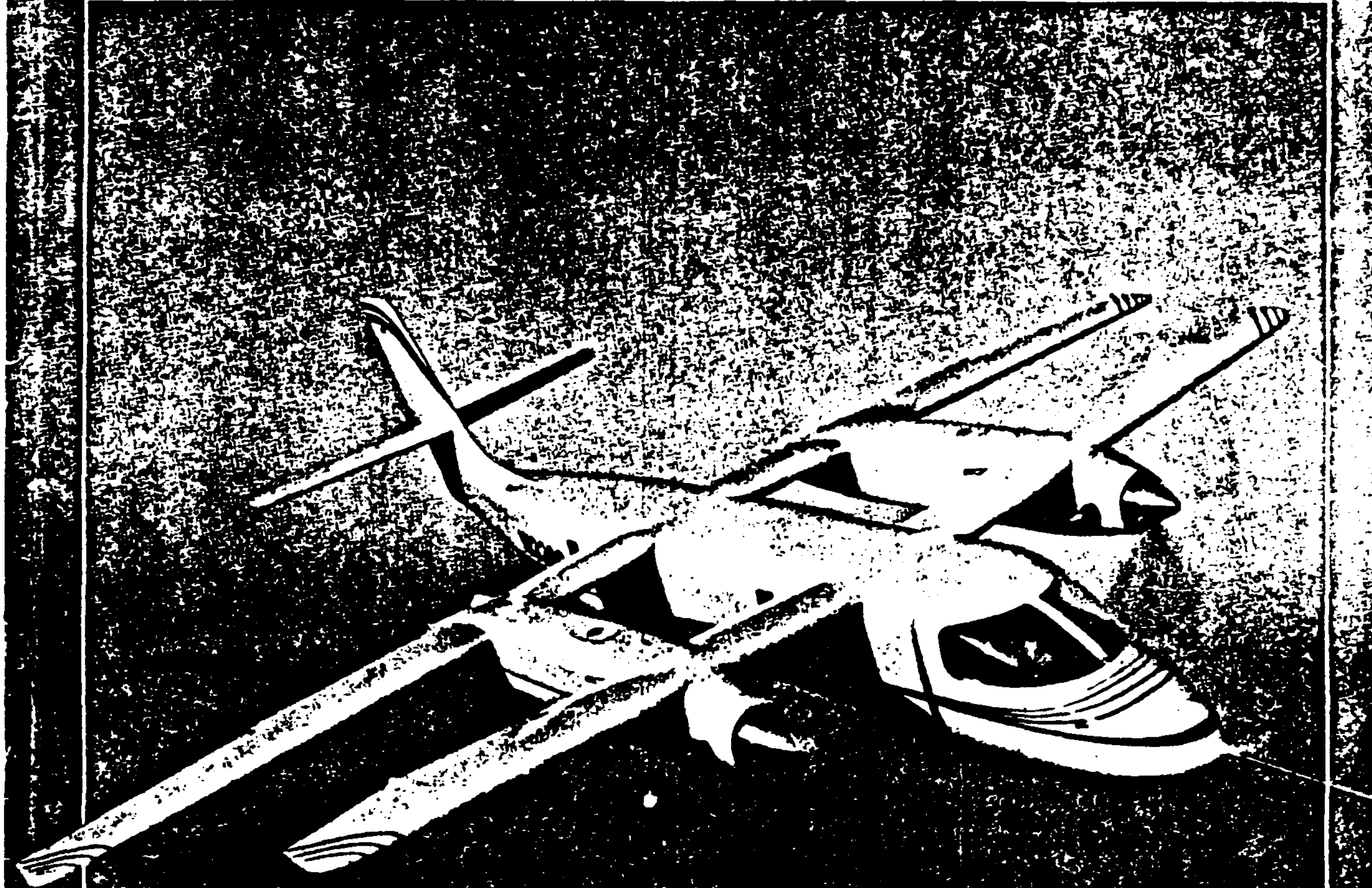
16 MONTHS

$103 MILLION

C-187 1071

AVIATION WEEK & SPACE TECHNOLOGY

A MCGRAW-HILL PUBLICATION $10.00 MARCH 14, 1988



AEROSPACE FORECAST & INVENTORY

BENEFITS
PER GOVERNMENT PROGRAM MANAGERS

- REQUIRES UNDERSTANDING OF PRIME OBJECTIVES AND WHAT'S IN THE CONTRACT
- ADAPTS TO CONTRACTORS' METHODS AND PROCEDURES
- STIMULATES INGENUITY
- PRECLUDES/REMOVES BARRIERS TO PRODUCTIVITY
- FOCUSES MANAGEMENT ATTENTION ON PRIORITY ITEMS
- ENHANCES QUALITY
- SAVES $ $ $ $ $ $

GH88-1102.5

ACQUISITION STREAMLINING

SAVINGS AND COST AVOIDANCES

- **12 MAJOR PROGRAMS**
- **AVERAGE SAVINGS OVER $240 $\overline{\text{M}}$ EACH**

GH88-1172.9

ACQUISITION STREAMLINING IMPLEMENTATION SHOULD IMPROVE WITH

- FARs AND DFARs
- HANDBOOK
- TRAINING
- REVISED DoDD 5000.1 AND 5000.2
- NEW QUALITY CULTURE

GH88-1131.41

I TALKED EARLIER ABOUT DOD DIRECTIVE 5000.43, "ACQUISITION STREAMLINING." IN CLOSING I WANT TO GIVE YOU ONE QUOTE FROM IT.

"AS A FIRST PRIORITY, THIS DIRECTIVE ESTABLISHES POLICY FOR STREAMLINING SOLICITATION AND CONTRACT REQUIREMENTS BY: A. SPECIFYING CONTRACT REQUIREMENTS IN TERMS OF THE RESULTS DESIRED, RATHER THAN "HOW-TO-DESIGN" OR "HOW-TO-MANAGE"; B. PRECLUCING PREMATURE APPLICATION OF DESIGN SOLUTION, SPECIFICATIONS, AND STANDARDS; C. TAILORING CONTRACT REQUIREMENTS TO UNIQUE CIRCUMSTANCES OF INDIVIDUAL ACQUISITION PROGRAMS; AND D. LIMITING THE CONTRACTUAL APPLICABILITY OF REFERENCED DOCUMENTS TO ONLY THOSE THAT ARE ESSENTIAL." (UNDERSCORING IS MINE)

LET'S GET BEHIND THESE POLICIES AND SEE THAT THEY ARE ROUTINELY IMPLEMENTED . . . WITH UNDERSTANDING OF THE PROBLEMS, THEIR COST AND THEIR SOLUTIONS . . . AND ENOUGH DISCIPLINE TO CHANGE AN EMBEDDED CULTURE. SOMEONE HAS TO SAY NO! . . . NO! . . . NO TO HOW-TO-MANAGE!

DoD STANDARDIZATION PROGRAM

- HAS TAKEN THE RAP FROM HOW-TO REQUIREMENTS
  - a. LESS THAN 1% OF 50,000 SPECS AND STDS
  - b. MORE THAN 90% OF UNNECESSARY SPEC COST

- WHAT MUST BE DONE TO REVERSE ATTITUDE, REDUCE COST, AND IMPROVE QUALITY
  - a. EXISTING DOCUMENTS
    - — DELETE HOW-TO
    - — CANCEL
    - — PROHIBIT CONTRACTUAL APPLICATION
  - b. NEW DOCUMENTS
    - — PROHIBIT HOW-TO
  - c. REFERENCE 29 MARCH 88 CODSIA 23-83 LETTER (ATTACHED)

GH88-1172.6

COUNCIL OF DEFENSE AND SPACE INDUSTRY ASSOCIATIONS (CODSIA)

1620 Eye Street, N.W., Suite 1000
WASHINGTON, D.C. 20006

(202) 659-5013

CODSIA 23-83
March 29, 1988

Mr. R. O. Black
Principal Asst Deputy for Research
Development and Acquisition
U.S. Army Materiel Command
5001 Eisenhower Avenue
Alexandria, VA 22333-0001

Mr. G. C. Hoffmann
Specification Control Advocate
General (Shipbuilding & Logistics)
Office of the Asst Secretary
Washington, D.C. 20360-5000

B/G T. W. Honeywill
SAF/AQXA
The Pentagon, Room 4C331
Washington, D.C. 20330

Mr. R. C. McCormack
Deputy Asst Secretary of Defense
(Production Support)
The Pentagon, Room 3E144
Washington, D.C. 20301-8000

Gentlemen:

The purpose of this letter is to respond to two Army, two Navy, two Air Force and one OSD similar requests to provide a list of DoD documents which should be top priority to fix or cancel consistent with the objectives of the Aquisition Streamlining Initiative. Encl. 1 identifies 50 documents among the most troublesome to industry. They are not in priority order. The list includes those transmitted to you March 12, 1987. We appreciate that some of these documents previously submitted to you are being revised. However, since none of them have been cancelled or reissued in an improved version, we have included them in encl. 1 in order to avoid any misunderstanding. Encl. 1 is the top priority list. Encl. 2 provides rationale for the new named documents and also identifies references to pertinent and previous recommendations made by AIA, EIA, NSIA and CODSIA.

Numerous studies of DoD acquisition have concluded that DoD should not levy how-to-manage requirements on contractors. In 1970 the President's Blue Ribbon Defense Panel's report on the Acquisition Process stated:

> "It was interesting to note that in early 1966 both industry and the DoD had independently arrived at the same identification of the problem ... great proliferation of management systems coming at us from many directions at an ever increasing rate ... we find that many of them are divergent, conflicting, unintegrated, and inconsistently applied."

This problem has multiplied over two decades. The 1986 Defense Science Board concluded:

> "Use of commercial <u>products</u> should result in l[illegible]al savings. Savings thru use of commercial <u>practices</u> for military products [illegible] even greater."

Best wishes for unparalleled success in eliminating counterproductive requirements. Thank you for the opportunity to contribute to this vital objective. We are impressed with the teamwork and recent accomplishments of the Streamlining Advocates' Ad Hoc Committee. Keep up the good work.

Sincerely,

D. Fuqua
President
Aerospace Industries Association

L. A. Caffiaux
Senior Vice President
Electronic Industries Association

W. H. Robinson, Jr.
President
National Security Industrial Association

Attachments
cc: F. E. Doherty
P. Yurcisin

FIFTY OF THE DOD DOCUMENTS MOST IN NEED OF ACTION
TO ELIMINATE COUNTERPRODUCTIVE REQUIREMENTS

1.	DOD-STD-35	Automated Engineering Documentation System
2.	DOD-STD-100C	Engineering Drawing Practices
3.	MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
4.	MIL-STD-130	Identification Marking of U.S. Military Property
5.	MIL-STD-275	Printed Wiring for Electronic Equipment
6.	DOD-STD-347	Product Assurance Program Requirements, Electrical and Fiber Optic Components Proposed Revision A
7.	MIL-STD-454	General Requirements for Electronics Equipment
8.	MIL-STD-461	Electromagnetic Interference Characteristics for Equipment
9.	MIL-STD-462	Electromagnetic Interference Characteristics, Measurement of
10.	MIL-STD-483*	Configuration Management Practices, . . .
11.	MIL-STD-490A	Specification Practices
12.	MIL-STD-785B	Reliability Program Requirements
13.	MIL-STD-810D	Environmental Test Methods and Engineering Guidelines
14.	MIL-STD-882*	System Safety Program Requirements, Proposed Notice 2
15.	MIL-STD-883C	Test Methods and Procedures for Micro electronics
16.	MIL-STD-965A	Parts Control Program
17.	DOD-D-1000B	Drawings, Engineering and Associated Lists
18.	MIL-STD-1388-1A	Logistic Support Analyses
	MIL-STD-1388-2A	Logistic Support Analysis Record, Requirements for
19.	MIL-STD-1520C*	Corrective Action and Disposition System for Nonconforming Material
20.	MIL-STD-1528A*	Manufacturing Management Program
21.	MIL-STD-1535*	Supplier Quality Assurance
22.	MIL-STD-1567A*	Work Measurement
23.	DOD-STD-1686	Electrostatic Discharge Control Program . . .
24.	DOD-STD-2000-1B	Soldering Technology, High Quality/High Reliability
	DOD-STD-2000-2	Part and Component Mounting for High Quality/High Reliability Soldering Electrical and Electronic Assemblies
25.	DOD-STD-2167*	Defense System Software Development
26.	MIL-E-5400	Electronic Equipment, Airborne, General Spec for
27.	MIL-W-8611A	Welding, Metal Arc and Gas, Steel and Corrosion and Heat Resistant Alloys, Process for
28.	MIL-Q-9858A/ DOD-HDBK-H50	Quality Program Requirements Evaluation of Contractor's Quality Program
29.	MIL-P-11268K	Parts, Materials, and Processes Used in Electronic Equipment
30.	MIL-P-22809A	Printed Wiring Assemblies

* Indicates the document should be converted to a non-contractual guide or cancelled.

- OVER -

Enclosure (1)
CODSIA 23-83
29 Mar 88

31. MIL-M-38510 — Microcircuit, General Specification for
32. MIL-S-45743E — Soldering Manual Type, High Reliability Electrical and Electronic Equipment
33. MIL-P-46843B — Printed Wiring Assemblies
34. MIL-S-52779 — Software Quality Assurance Program Requirements
35. MIL-P-55110C — Printed Wiring Boards
36. DOD-4120.3M — Defense Standardization Program Manual, Change 5
37. DODI 4120.19 — DoD Parts Control Program
38. DODI 7000.2 — Performance Measurement
39. DODI 7000.10 — Contract Cost Performance, Funds Status and Cost/Schedule Status Reports
40. AFSCP/AFLCP 173-5/ DARCOM-P 715-5/NAVMAT P2580/DLAH 8315.2 — C/SCS Joint Implementation Guide
41. DARCOM-P 750-16 — Material Readiness Support Activity (MRSA) LSA/LSAR Software Programs and Commodity Command Standard System (CCSS)
42. WS-6536 — Procedures and Requirements for Preparation and Soldering of Electrical Connections
43. AFSCMD REG 178.16 — Contractor Operations Reviews
44. DCAS Contract System Status Guide
45. DAR Clauses 7-104.87 and 7-2003.43 — Cost/Schedule Control System
46. *DFAR 34.005-70* — *Special Conditions*
47. AFSC-REG 800-XX — Get SPEC
48. AFSC CMD Letter — AFSC CMD "Year of Quality," Letter dated Sep 87
49. AFSC FAR Supplement Parts 5315 and 5352 — Work Measurement Policy and Clauses
50. FAR 52.219-9 — Small and Small Disadvantaged Business Subcontracting Plan

There are hundreds, if not thousands, of additional DoD documents which contain some how-to-manage/how-to-design/how-to-test requirements. When any existing document is revised, it should be purged of such requirements. In the meantime, such documents should either be converted to non-contractual guides or contractually applied only after "how-to" requirements have been tailored out. There should be a strictly enforced prohibition on the issuance of any new document which contains "how-to" requirements.

In 1981 then DepSecDef Carlucci said "One big area in which we believe costs may be significantly reduced is government participation in the contractor's internal management." We heartily agree.

21 Mar 88

QUALITY ASSURANCE DOCUMENTS
(Latest count - 78)

AFCMD Reg 178-1	Integrated Contractor Assessment Program (ICAP)
AFCMD Reg 178-16	Contractor Operations Reviews
AFCMDR 74-1	Quality and Reliability Assurance
AFR 66-33	Prevention of Foreign Object D. age (FOD) to Aircraft, Missiles, or Drones
AFR 74-1	Quality Assurance Program
AFR 74-15	Procurement Quality Assurance
AFLC ESS Initiative (Sep 87)	Environmental Stress Screening
AFSC CMD (Sep 87)	Year of Quality
AFSCP 74-3	Quality Assurance Guide for Application and Implementation of MIL-STD-1520A (USAF)
AFSCP 800-XX	Software Quality Indicators (has been published, don't know number)
AFSCP 800-52	Product Assurance and Acquisition Logistics (PAAL)
AFSCR 310-1	Inspection and Acceptance of Data
AFSCR 800-XX (Draft)	Get Specified Product End Conformance (Get SPEC)
AMC-Reg-702-32	Critical Safety Item Program
AMC-Reg-702-XX (Draft)	Contractor Performance Certification Program
ANSI/ASME N45.2-1977	Quality Assurance Program Requirements for Nuclear Facilities
ANSI/ASME N45.2.5-1978	Supplementary Quality Assurance Program Requirements for Installation, Inspection, and Testing of Structural Concrete, Structural Steels, Soils, and Foundations during the Construction Phase of Nuclear Power Plants
ANSI N45.2.10-1973	Quality Assurance Terms and Definitions
ANSI N45.2.11-1974	Quality Assurance Requirements for the Design of Nuclear Power Plants

Enclosure (3)

ANSI/ASQC-Z-1.15-1979	Generic Guidelines for Quality Systems
AR-92 Notice 1	Quality Program Requirements
DCAS	Contractor System Status Review (CSSR) Guide
DLA Reg 8200.10	Control of Nonconforming Material (Concerns Material Review Board Activities)
DLA Reg 8300.5	Contractor Improvement Program
DLAH 8200.1	Defense In-Plant Quality Assurance Program
DLAH 8400.3 (Draft)	System Status Review Guide
DSAM 8200.1	Quality Assurance Manual
DoD 4245.7M	Transition from Development to Production
DoDD 4155.1	Quality Programs (A&L)
DOD-HDBK-50	Evaluation of a Contractor's Quality Program
DOD-HDBK-51	Evaluation of a Contractor's Inspection System
DoD-Initiative	Total Quality Management
DoDI 4155.20	Contractor Assessment Program
DOD-STD-347	Product Assurance Program Requirements for Fiber Optic Components
DOD-STD-1686	Electrostatic Discharge Control Program for Protection of Electrical/Electronic Parts/Assemblies/Equipment
DOD-STD-2000 Series	Soldering Technology Standardization Documents
DOD-STD-2101	Classification of Characteristics
DOD-STD-2167 (4 Jun 85)	Defense System Software Development
DOD-STD-2168 (Draft)	Software Quality Assurance
DSAM 4155.2	Evaluation of a Contractor Inspection System
FAR Part 21	Federal Aviation - Part 21 - Certification Procedures for Products and Parts
FAR 46.102	Quality Assurance Policy

FAR 46.407	Nonconforming Materials
FAR 52.246-2	Inspection of Supplier, Fixed Price
MIL-HDBK-H52	Evaluation of a Contractor's Calibration System
MIL-HDBK-728/1	Military Handbook - Nondestructive Testing
MIL-I-6866	Penetrant Inspection
MIL-I-6868	Inspection Process, Magnetic Particle
MIL-I-6870	Inspection Program Requirements, Nondestructive for Aircraft/Missile Materials and Parts
MIL-I-8950	Ultrasonic Inspection Process for Wrought Metals
MIL-I-45208A	Inspection System Requirements
MIL-M-85337	Manuals, Technical: Quality Assurance Program; Requirements for
MIL-Q-9858	Quality Requirements
MIL-S-52779A	Software Quality Assurance Program Requirements
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-109	Quality Assurance Terms and Definitions
MIL-STD-410	Nondestructive Testing Personnel Qualification and Certification
MIL-STD-453	Inspection, Radiographic
MIL-STD-965	Parts Control Program
MIL-STD-980	Foreign Object Damage (FOD)
MIL-STD-1235B	Single and Multi-level Continuous Sampling Procedure and Table for Inspection by Attributes
MIL-STD-1264	Radiographic Inspection for Soundness of Welds in Steel by Comparison to Graded ASTM E390 Reference Radiographics
MIL-STD-1518	Storage, Handling, and Servicing of Aviation Fuels, Lubricating Oils and Hydraulic Fluids at Contractor Facilities
MIL-STD-1520	Nonconforming Material

MIL-STD-1521	Technical Reviews and Audits for Systems, Eequipments, and Computer Software
MIL-STD-1535	Subcontractor Quality Assurance
MIL-STD-1556	Defective Parts and Components Control Program
MIL-STD-1679	Weapon System Software Development
MIL-STD-1949A (Proposed)	Inspection, Magnetic Particle
MIL-STD-21Q7 (Navy)	Product Assurance Program Requirements for Contractors
MIL-STD-2154	Ultrasonic Inspection of Wrought Materials
MIL-STD-45662	Calibration System Requirements
MIL-STD-XXX (Navy) (Draft)	Product Assurance Program Requirements for Contractors
NAVSO P6071	Best Practices
SAMSO-STD-73-5B, Notice 1, 2, 3	Quality Assurance Requirements for Space and Missile Systems
SecNav Instruction 4855.2	Contract Requirements for Manufacturing Quality Data
T.O. 00-350-54	MIP Response Program (QDR's Service Reported)
WS 6536 (NASC)	Process Specification Procedures/Requirements for Preparation/Soldering of Electrical Connectors

Office of Federal Procurement Policy
Charles W. Clark

Talking Points for Standardization Conference

- o First of all, I would like to thank Pete Yurcisin and the Program Committee for affording OFPP an opportunity to participate in your Conference. I am particularly pleased to note that the Conference is entitled "Supporting the Acquisition Process".

- o One of the first projects that I got involved with when I came to OFPP in late 1975, was the development of policies to implement the Commission on Government Procurement Recommendations pertaining to the acquisition of commercial products and the improvement of specifications. The Commission's recommendation was fairly simple, i.e., the Government should commence to acquire commercial products in lieu of products tailor-made to Government specifications and standards. This recommendation, however, has proven to be more profound and complex than it initially appeared. In the mid-70's, when I started working with DLA and what was then called DMSSO (the Defense Materiel Standardization and Specification Office) to develop the necessary policies, I was never quite sure whether standardization was supporting acquisition or whether acquisition was merely a subset of standardization. Nevertheless based on the theme and the title of your Conference, I am glad to see that the perspective on that issue has been clarified.

- o A lot of times we tend to look at acquisition, standardization, logistics, quality and other technical and engineering requirements as ends onto themselves, rather than as means of supporting, in your case, the national defense and in all of our cases giving the taxpayer the best return on his or her tax dollar.

- o There is an inherit tension between a good standardization program and the procurement office and the logistical systems that support our various programs. I believe that this tension, to the extent that it exists, is generally a healthy symptom and I don't think our competing objectives are entirely mutually exclusive. The standardization objectives of providing for interchangeability, interoperability, reliability, maintainability, and to eliminate redundancies in the logistical system and to provide for all of the benefits that go along with the various "ilities" is not necessarily incompatible with the

procurement objective of making sure that product descriptions used in our RFP's and IFB's reach the broadest possible cross-section of the commercial marketplace and result in the acquisition of quality products - not on the basis of low bid but on a best value basis.

- The key to developing good product descriptions whether FEDSPECS, MILSPECS, FED Standards, MIL Standards, Commercial Item Descriptions, or Industry Standards is in working together in a collegial, coherent manner and in balancing competing objectives, it is the same as the art of good Government.

- I remember in the early days of the CISP (Commercial Item Support Program) and CCAP (Commercial Commodity Acquisition Program) we were trying to convert FED and MILSPECS for clothing, textiles, welding rods, food and other common commercial items to commercial item descriptions. We would go to DLA and DLA would say well that feature of the SPEC was put in by DPSC. DPSC is the procuring activity and they know the industry and they know how to write Specs to reach the most vendors. We would go to DPSC and they would say that while they knew the industry the particular feature of the spec in question was put in by Natick Labs which was the specification preparing activity. We would go to Natick and Natick would refer you back to AFPEC (the Armed Forces Product Evaluation Committee) or to the DMMB Board, the Defense Medical Materiel Board). It was kind of a classical situation where everybody was responsible but no one organization seemed to be in charge.

- At that time, there wasn't any real effort being made, nor data available, to help make the cost benefit-trade-off decisions that are necessary to assess the consequences of technical, engineering and business determinations during the specification development process.

- Several years ago, a new word cropped-up in management circles. The word I am thinking of is "synergy". I am not certain that I am using the concept right, but as I understand it the "synergistic effect" supposedly means that the sum of the whole exceeds the sum of the parts.

- I think that the concept of synergy is a very appropriate way of viewing the specifications - product description development process. I think that if all of the players in the process (the engineers, the logisticians, the acquisition experts and the users)

worked jointly and concurrently sharing information, we could develop better product descriptions whether specifications, standards or commercial item descriptions than are now achieved by working sequentially or consecutively. We should come up with descriptions that result in better products; that could be supported better; that meet end-users needs and that could be procured competitively in the open marketplace.

o In conclusion, it is important to note that specifications and standards are crucial; they are essential to a good acquisition program. In 1972, when the COGP made its report we had some 36,000 Federal Specs, Military Specs and Standards. Today, I guess we are probably approaching 46,000. Some of the problems that existed then exist today.

- Specifications are temporal, they start to age and deteriorate from the day they are developed. It takes a lot of time to develop, print, distribute, store and maintain standards and specs. Some are obsolete by the time they are developed. Some are five, ten, fifteen years old, and you begin to wonder about the benefits of such old product descriptions.

- Many of the specs and standards were criticized for relying too much on references to secondary and tertiary documents. You read a spec, it refers to a secondary document, you read that document, and are referred to three or four others. People who work with specifications and use them all of the time (whether prospective vendors or standardization folks) understand these references. But for people trying to break into the Government procurement arena, its a very imposing obstacle.

- Many of the specifications are too restrictive. Some commercial companies that have totally acceptable products don't compete for Government requirements as they would have to alter their products or production processes to meet the letter of the specification.

- Specification development in some respects results in averaging the users' needs. This means that some products meeting the letter of the specification exceed the needs of about half the users and are less than the other half.

- While problems associated with specs and standards and the relative roles and responsibilities of specification developers, logisticians, engineers and acquisition personnel have not been totally resolved, it doesn't mean that we haven't accomplished anything.

- Many dated and obsolete specs have been cancelled, replaced with industry standards, or converted to commercial-type documents. The body of specifications has not increased proportionately to the overall procurement program. In 1972, we had some 36,000 specs and a procurement program of less than $58 billion. Today, procurement within the Executive branch approximates $200 billion per year. Competition has increased significantly over the last eight years, from 41% of all contract dollars in 1981 to over 57% today. These accomplishments could not have been achieved without a well run and managed specification program.

- There is, however, still a lot of work to be done in the specifications and standards area. There is a lot of money, yet, to made for the taxpayer in this are. We can improve the products that we are now obtaining. Specs are important; they are critical, and we need to give them the attention they deserve by developing more coherent policies to define the roles, responsibilities and procedures by which specs will be developed, maintained and used in the procurement process.

SPEECH FOR

DOD 1988

STANDARDIZATION

AND

DATA MANAGEMENT CONFERENCE

22-24 AUGUST 1988

COLONEL CRAIG E. BRODIE

GOOD MORNING.

YOU WILL NOTICE MY UNIFORM IS DIFFERENT. MY PURPOSE HERE IS ALSO DIFFERENT. I HAVE THE TASK OF ATTEMPTING TO GET YOUR JUICES FLOWING FOR THE PANEL DISCUSSIONS WHICH FOLLOW. I HAVE NO STUDIES TO QUOTE. THIS IS THE OPINION PART OF THE PROGRAM. LET ME START BY SPENDING JUST A MOMENT TELLING YOU HOW I GOT THIS DUBIOUS ASSIGNMENT.

SEVERAL WEEKS AGO JIM KNOWLES, AT THE ARMY MATERIEL COMMAND, CALLED AND ASKED IF I KNEW THE NAME OF A PROGRAM MANAGER WHO MIGHT BE ABLE TO DISCUSS ALL OF THE PANEL TOPICS SELECTED FOR THIS CONFERENCE. I IMMEDIATELY SENSED TROUBLE. NOT WANTING TO GET INVOLVED I SMUGLY SUGGESTED THAT WHEN HE FOUND SOMEONE WHO COULD SPEAK KNOWLEDGEABLY ABOUT ALL OF THE TOPICS HE SHOULD LET ME KNOW. THAT WAS MY FIRST MISTAKE. JIM SAID, YOU'RE PROBABLY RIGHT. WHAT WE REALLY NEED IS SOMEONE WHO WORKS IN THE

DATA AND STANDARDIZATION BUSINESS. HOW ABOUT YOU? I QUICKLY EXPLAINED I COULD NOT ACCEPT BECAUSE I WOULD BE NEARING RETIREMENT FROM ACTIVE DUTY. THAT WAS MY SECOND MISTAKE. JIM SAID, THAT'S PERFECT, WE WANT SOMEONE WHO WILL DARE TO TELL IT LIKE IT IS. OBVIOUSLY MY EFFORTS TO STAY UNINVOLVED FAILED. I KNOW MY THIRD MISTAKE WOULD BE TO KEEP YOU PAST LUNCH. I'LL NOT STRIKE OUT.

MY FIRST CONCERN WAS HOW LONG I WOULD HAVE TO TALK. AFTER SOME NEGOTIATION I WAS TOLD I WOULD HAVE A FULL 13 MINUTES JUST BEFORE LUNCH. LUCK RUNS IN MY FAMILY. I REMEMBER THINKING, HERE IS A TYPICAL GOVERNMENT ASSIGNMENT. EIGHT TOPICS AND 13 MINUTES TO STIMULATE THOUGHT. RIGHT AWAY I RECOGNIZED THAT I WOULD EITHER HAVE TO SPEAK AT A TREMENDOUS RATE OF SPEED OR NARROW THE DISCUSSION. FRANKLY, TALKING FAST WAS THE MORE ATTRACTIVE ALTERNATIVE BUT I DECIDED TO ABANDON IT ON THE THEORY YOU WOULD SURELY STOP LISTENING LONG BEFORE I STOPPED TALKING. THAT LEFT THE ONE IDEA STRATEGY AND THAT IS HOW I WILL PROCEED.

(SLIDE 1 ON)

PAUSE

THIS CHART SHOWS THE TOPICS WE WILL DISCUSS DURING OUR PANEL MEETINGS THIS WEEK. AS I PONDERED THESE TOPICS LOOKING FOR A THEME I DISCOVERED THERE REALLY IS A THREAD OF CONFUSION WHICH RUNS THROUGH ALL OF THEM.

FIRST YOU WILL NOTICE THESE TOPICS RARELY APPEAR ON THE SAME CHART AND EVEN MORE RARELY ARE THEY DISCUSSED AS INTERLOCKED PIECES OF A LARGER WHOLE. WE CAN'T BLAME ANYONE FOR THIS. IT'S SIMPLY THE NATURE OF OUR BUSINESS. CENTURIES AGO MAN LEARNED THAT THE ONLY WAY TO EAT AN ELEPHANT WAS ONE BITE AT A TIME, AND SINCE EACH OF THESE TOPICS IS VERY LARGE WE HAVE SENSIBLY WORKED WITH THEM IN BITE SIZED PIECES.

WELL, WHAT DOES ALL THIS HAVE TO DO WITH THE THREAD OF CONFUSION? LET ME ANSWER THAT QUESTION BY INTRODUCING AN AXIOM OF MINE WHICH I SHALL REFER TO FROM TIME TO TIME AS "THE PROBLEM".

(SLIDE 2 ON)

PAUSE

IN FACT WHAT YOU SEE HERE MAY ALSO BE SOMEONE ELSE'S AXIOM AND IF IT IS, FORGIVE ME FOR ATTACHING MY NAME TO IT. THE SOURCE ISN'T IMPORTANT. THE IDEA IS. WHAT THIS SUGGESTS, OF COURSE, IS THAT BECAUSE WE HAVE ALWAYS HAD A VERY LARGE ELEPHANT TO EAT IN TERMS OF OUR STANDARDIZATION AND DATA POLICY, AND THE ONLY WAY WE KNEW HOW TO EAT IT WAS ONE BITE AT A TIME, WE, QUITE UNINTENTIONALLY, FRAGMENTED THE DEVELOPMENT OF OUR POLICY, AND IN DOING SO HAVE COMPLICATED AND CONFUSED THINGS AT THE POINT OF EXECUTION.

"NOT TRUE" SOME OF YOU WILL SAY! YOU WILL POINT OUT, QUITE CORRECTLY, THAT THE CONDITION DESCRIBED BY THE AXIOM ISN'T INEVITABLE AND WILL ARGUE THAT INDEED THERE IS A SOLUTION TO "THE PROBLEM".

(SLIDE 3 ON)

PAUSE

THE SOLUTION, OF COURSE, IS THAT MYSTERIOUS PROCESS WE CALL "COORDINATION" WHICH FROM THIS POINT FORWARD I SHALL REFER TO AS "THE SOLUTION". TO THIS DAY I MUST CONFESS I CAN'T TELL YOU IF THE COORDINATION PROCESS IS AN ART OR A SCIENCE OR IF IT IS SIMPLY MAGIC. CLEARLY IT INVOLVES BLIND FAITH. AND WHATEVER IT IS, WHENEVER WE COORDINATE, WE BELIEVE THAT PEOPLE OUTSIDE OF, AND NOT FAMILIAR WITH, OUR SMALL WORLD WILL IN SOME MYSTERIOUS WAY FULLY UNDERSTAND THE IMPLICATIONS OF WHAT WE PROPOSE. I THINK ALL OF US KNOW THOSE WE COORDINATE WITH FREQUENTLY DO NOT UNDERSTAND. THEN, WE WHO ARE EQUALLY UNFAMILIAR WITH OTHER WORLDS TRY TO SELL OUR PROPOSALS BY TELLING OTHERS TO "TRUST US". THIS IS WHERE THE BLIND FAITH COMES IN!

I THINK BY NOW YOU RECOGNIZE I AM NOT CONVINCED THAT "THE SOLUTION" SOLVES "THE PROBLEM". IN FACT, IT SEEMS TO ME THAT THE IDEA OF THE AXIOM IS CORRECT AND THE MORE WE BREAK DOWN RESPONSIBILITIES FOR WHAT WE ARE DOING, THE MORE COMPLEX THE SYSTEM BECOMES.

"WELL, SO WHAT?" YOU SAY. WHAT DOES ALL THIS NEAT PHILOSOPHY HAVE TO DO WITH THE ISSUES BEFORE US AT THIS CONFERENCE? I THINK IT HAS A GREAT DEAL TO DO WITH THEM. LET ME EXPLAIN.

(SLIDE 4 ON) NOTE: REPEAT OF SLIDE 1

HERE IS THE LISTING OF PANEL DISCUSSION TOPICS I SHOWED EARLIER. AS YOU KNOW WE HAVE POLICY ESTABLISHED IN EACH ONE OF THESE AREAS WHICH THOSE OF US WHO BUY AND SELL DEFENSE PRODUCTS ARE ATTEMPTING TO IMPLEMENT. IN ISOLATION EACH POLICY SEEMS TO MAKE PRETTY GOOD SENSE.

THE POLICY WHICH CHALLENGES US TO BUY OFF THE SHELF ITEMS WHENEVER WE CAN IS LOGICAL. WHY REINVENT THE WHEEL? POLICIES TO STANDARDIZE WITH OUR ALLIES AND AMONG OURSELVES, TO REDUCE COSTS, HOLD DOWN INVENTORY, AND IMPROVE READINESS ARE LOGICAL. OUR DRIVE TO INCREASE COMPETITION WHICH EXPANDS OUR INDUSTRIAL BASE AND CONTROLS OVERPRICING IS LOGICAL. OUR DRIVE TO BUILD QUALITY INTO A PRODUCT RATHER THAN MEASURE THE LACK OF IT ONCE IT IS BUILT IS LOGICAL. FAIRNESS IN DATA RIGHTS BOTH FOR INDUSTRY AND THE GOVERNMENT IS LOGICAL. AND FINALLY, WHO CAN OBJECT TO THE FLURRY OF

NEW POLICIES DESIGNED TO INTRODUCE A MORE COMPETITIVE, MORE DECISIVE, MORE STREAMLINED ACQUISITION PROCESS.

LOOKED AT ONE BY ONE EACH POLICY IS APPEALING. UNFORTUNATELY, "THE PROBLEM" COMES INTO PLAY WHEN WE TRY TO PUT THESE EXCELLENT IDEAS TOGETHER.

LET ME ILLUSTRATE MY POINT BY EXPLORING WITH YOU HOW SOME OF OUR APPARENTLY GOOD POLICIES INTEGRATE WHEN APPLIED WHERE THE RUBBER HITS THE ROAD. IF OUR POLICY IS TO BUY AN ITEM WHICH IS TRULY NONDEVELOPMENTAL HOW IN THE WORLD ARE WE GOING TO STANDARDIZE IT? ISN'T IT TRUE THAT DIFFERENCES IN PRODUCTS, NOT SIMILARITY, CREATES COMPETITION IN THE MARKET PLACE. WITHOUT COMPETITION AND DIFFERENCES, WE WOULD NOT HAVE NONDEVELOPMENTAL ITEMS IN THE FIRST PLACE. IF INDUSTRY HAS PAID TO FUND THE DEVELOPMENT OF AN ITEM *ISN'T IT FAIR THAT INDUSTRY RETAIN OWNERSHIP OF* THE DESIGN. BUT IF WE USE A NONDEVELOPMENTAL ITEM APPROACH, HOW THEN CAN WE DEMAND TRANSFERS OF DATA FROM INDUSTRY TO THE GOVERNMENT SO WE CAN BUY OUR SPARES COMPETITIVELY? OR, DON'T WE CARE IF WE COMPETE AT THE SPARES LEVEL?

THEN THE GURU OF QUALITY, DR. DEMING, WHO IS CLAIMED TO BE THE FATHER OF THE JAPANESE INDUSTRIAL REVOLUTION TELLS US THAT BUILT IN QUALITY AND COMPETITION SOMETIMES DO NOT GO HAND-IN-HAND. WHEN WE BUY NONDEVELOPMENTAL ITEMS HOW CAN WE STANDARDIZE AT RATES FASTER THAN INDUSTRY WANTS TO GO? HOW DO WE IMPLEMENT METRICS ACROSS THE BOARD WITHOUT CREATING MIX AND MATCH SITUATIONS WITH ALREADY FIELDED EQUIPMENT WE CAN'T LIVE WITH LOGISTICALLY?

THE CONFUSION EVEN REACHES INTO OUR OBJECTIVES FOR ACQUISITION STREAMLINING. THINK ABOUT IT. HOW CAN WE MAKE A PERFORMANCE SPECIFICATION FOR A SYSTEM AS BROAD AND ALL ENCOMPASSING AS POSSIBLE TO ENHANCE COMPETITION AND AT THE SAME TIME ASK THAT ALL THE STANDARDS RELATED TO THE ACQUISITION BE TAILORED TO THE ITEM TO BE PROCURED? IF WE DON'T KNOW IF WE WILL BE WELDING ALUMINUM ARMOR OR PUTTING TOGETHER SOME SHEET METAL ITS PRETTY HARD TO TAILOR A GENERIC STANDARD TO FIT THE BILL. SOME WILL SAY, ABANDON THE STANDARDS, BUT THEN, WHAT DO WE WANT TO STANDARDIZE? DO WE KNOW?

WELL, IF YOU BUY MY THUNDER THAT WE HAVE PROBLEMS WITH CONSISTENCY WHEN WE TRY TO INTEGRATE OUR POLICIES CAUSED BY "THE PROBLEM" AND IF LIKE ME YOU ARE SKEPTICAL ABOUT HOW WELL COORDINATION CAN WORK AS "THE SOLUTION" WHAT CAN WE DO ABOUT IT? IN FACT THERE ARE NO SIMPLE ANSWERS. OTHER FORCES ARE AT WORK.

BY CREATING POLICY IN A STOVEPIPE WE NOT ONLY GET THE INCONSISTENCY, WE HAVE ALREADY DISCUSSED BUT WE ALSO FREQUENTLY COMPLICATE THE PROCESS. THIS PHENOMENON HAPPENS ALMOST WITHOUT NOTICE. LET ME GIVE YOU A FEW EXAMPLES. WHEN THE CONGRESS SAID COMPETE, WE ADDED JUSTIFICATIONS FOR NOT COMPETING TO THE PROCESS. WHEN WE DECIDED TO GO METRIC, WE COMPLICATED THE LOGISTICS PROCESS. WHEN WE SAID STREAMLINE THE ACQUISITION PROCESS WE ADDED STEPS TO SCRUB AND ELIMINATE REQUIREMENTS.

OUR DRIVE FOR CHANGE ALSO WORKS AGAINST CONSISTENCY AND SIMPLIFICATION. WE THINK IF THINGS DON'T CHANGE THERE IS NO PROGRESS. YOU KNOW WHEN YOU TEACH A DOG A TRICK HE WILL LEARN IT AND DO IT ALL OF HIS LIFE. THAT'S SIMPLE. WHEN WE LEARN A NEW TRICK, WE SOON GET BORED WE FIND FAULT AND WE CHANGE. THAT'S COMPLEX. NOW DO NOT MISUNDERSTAND. I AM A ADVOCATE OF CHANGE - BUT IT MUST BE CHANGE OF THE RIGHT SORT. THE QUESTION IS "DOES THE CHANGE COMPLICATE OR DOES IT SIMPLIFY?" ARE WE MAKING ONLY THOSE KINDS OF CHANGES THAT SIMPLIFY? I FEAR NOT. RARELY DO WE STOP DOING THINGS WHEN WE MAKE CHANGES AND WHEN WE ADD SOMETHING NEW TO TO WHAT ALREADY EXISTS WE USUALLY COMPLICATE, RATHER THAN SIMPLIFY, THE PROCESS.

THE MOST OBVIOUS SOLUTION TO "THE PROBLEM" IS TO SIMPLY PUT SOMEONE IN CHARGE. BUT WHO? WE DIVIDED THE ISSUES PRECISELY BECAUSE THEY WERE TOO LARGE TO BE EASILY MANAGED. AT THIS POINT, IT IS HARD TO KNOW IF ANYONE

IS IN CHARGE OTHER THAN THE FAMOUS "THEY". SOME WILL SAY, CONGRESS IS IN CHARGE. OTHERS WILL SAY DOD OR THE SERVICES ARE IN CHARGE. I HAVE EVEN HEARD THAT THE EMERGING COMPUTER AIDED LOGISTICS SYSTEM, WILL SOMEHOW SOLVE THE PROBLEM OF INTEGRATING ALL OUR EFFORTS. I THINK THE TRUTH IS THAT "THEY" ALL ARE IN CHARGE TO ONE DEGREE OR ANOTHER AND THAT'S NOT LIKELY TO CHANGE. FINDING ANYONE WHO DESERVES AN "A PLUS" FOR MAKING THE OVERALL SYSTEM WORK BETTER IS MIGHTY DIFFICULT.

THE PLAIN TRUTH IS THIS. THERE ARE NO MIRACLE DRUGS TO CURE THE DISEASE CREATED BY "THE PROBLEM". THE "SOLUTION" HAS NOT WORKED. CHANGE HAS NOT MADE THINGS LESS COMPLEX. WE ARE OUT OF WHACK AT THE POINT OF IMPLEMENTATION. FORCED TO WORK EVERYTHING IN A STOVEPIPE WE HAVE GENERATED A LOT OF SMOKE, USED A LOT OF FUEL, AND MUCH HEAT HAS GONE UP THE CHIMNEY. WE CAN ILL AFFORD TO FURTHER COMPLICATE THE DIFFICULT TASKS BEFORE US. YOU WHO WORK AT THE CUTTING EDGE OF OUR BUSINESS AND BEST UNDERSTAND THE DIFFICULTIES WE HAVE IMPLEMENTING OUR POLICY, ARE OUR BEST HOPE FOR IDENTIFYING WAYS TO DO THINGS BETTER. I THEREFORE URGE ALL OF YOU AS WE PARTICIPATE IN THE PANEL DISCUSSIONS TO LOOK HORIZONTALLY ACROSS THE ISSUES BEFORE US AND TAKE UP THE BATTLE CRY FOR CONSISTENCY AND SIMPLIFICATION.

IF MY LITTLE TALK HAS STIRRED YOUR MIND TO ACTION, AGREEMENT OR DISAGREEMENT I WILL HAVE SERVED MY PURPOSE. IF YOU ARE JUST PLAIN HUNGRY, LUNCH WILL SOON BE SERVED. I THANK YOU.

PANEL TOPICS

THE DEFENSE ACQUISITION APPROVAL PROCESS
METRICATION
NONDEVELOPMENTAL ITEMS
TOTAL QUALITY MANAGEMENT
PARTS CONTROL
DATA RIGHTS
INTERNATIONAL STANDARDIZATION
SPECIFICATION STREAMLINING

TAC3666-00/3

"THE PROBLEM"

THE WHOLE GETS MORE CONFUSED AND COMPLEX IN DIRECT PROPORTION TO THE FRAGMENTATION OF THE PARTS.

TAC3666-00/2

2

"THE SCHOOL SOLUTION"

COORDINATION PREVENTS CONFUSION AND COMPLEXITY
WHEN THE PARTS ARE FRAGMENTED.

TAC3666-0071

PANEL TOPICS

THE DEFENSE ACQUISITION APPROVAL PROCESS
METRICATION
NONDEVELOPMENTAL ITEMS
TOTAL QUALITY MANAGEMENT
PARTS CONTROL
DATA RIGHTS
INTERNATIONAL STANDARDIZATION
SPECIFICATION STREAMLINING

TAC3666-0073

1988 DOD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

PANEL 1 SESSION A

IMPACT OF THE NEW DEFENSE ACQUISITION BOARD PROCESS

This panel will discuss the new Defense Acquisition Board (DAB) and committee structure and examine the impact of the Defense Acquisition Board on the Milestone Decision Process; how it differs from the Defense Systems Acquisition Review Council (DSARC) and its predecessor, the Joint Requirements and Management Board (JRMB); the effects of the increased role of the Joint Chiefs of Staff; how the Joint Requirements Oversight Council (JROC) interfaces with the DAB; and the roles of the Acquisition Committees.

As result of these changes, is the DAB:

- o more issue oriented?
- o more streamlined?
- o more or less decision-oriented for the Program Manager?

What are the views of:

- o OSD Staff?
- o Services?
- o Office of the Joint Chiefs of Staff?

CHAIR: Mr. John E. Smith, Deputy Director, Acquisition Systems Management, OUSD(A)(PI/ASM)

PANELISTS: BG John Fairfield, Assistant DUSD, ODUSD/STNF
Dr. Sydell Gold, Deputy for Strategic Missile Systems and SDI, SAF/AQN
BG Ret Ed Hirsch, Chair, Center for Acquisition Management Policy, DSMC
LtCol Christopher A. Waln, Acquisition Policy Analyst, Joint Staff, Pentagon

OUSD(A)(PI/ASM)

DEFENSE ACQUISITION BOARD PROCESS

SUMMARY

- DAB/COMMITTEE STRUCTURE PROVIDES GOOD FRAMEWORK FOR OSD/SERVICE INTERACTION;
  - IMPROVES FOCUS ON ISSUES AT MILESTONE REVIEWS
  - OSD COMMITTEE MEMBERSHIP LARGE
- CREATION OF VCJCS
  - MORE ACTIVE AND CONSISTENT INVOLVEMENT IN ACQUISITION PROCESS.
  - LINK BETWEEN: STRATEGY - PLANS - REQUIREMENTS - PROGRAMS
- ACQUISITION CHAIN OF COMMAND (DAE - SAE - PEO - PM)
  - PROVIDES PM GREATER ACCESS TO LEADERSHIP
  - NOT FULLY IMPLEMENTED; PM BURDEN NOT SIGNIFICANTLY REDUCED

RECOMMENDATIONS:

- WORK TO FULLY IMPLEMENT ACQUISITION CHAIN AND SIMPLIFY PROCESS:
  - REDUCE EXTERNAL STAFF INFLUENCES/BRIEFINGS - SERVICE ACQUISITION EXECUTIVES
  - REVIEW OSD COMMITTEE MEMBERSHIP - OUSD(A)/PI/COMMITTEE CHAIRMEN
  - REDUCE FORMAL DOCUMENTATION & BRIEFINGS (EMPHASIS ON DEP) - OUSD(A)/PI/COMMITTEE CHAIRMEN
  - REPLACE WORKING GROUPS WITH INFORMAL OSD/SERVICE INTERACTION - COMMITTEE CHAIRMEN/SERVICES.

1988 DOD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

PANEL 1 SESSION B

Metrication--Your Role Now!

The panel will discuss the new DoD Metric policy; its impact on the acquisition process; what program managers and contractors need to do; and identification and development of needed metric standards.

CHAIR: Col Thomas Mansperger, OASD(P&L)SDM

PANELISTS: Mr. David Bentley, Manager, Air Space Technology Division, SAE, Inc.
Mr. Gerard R. Markham, Production Manager, T-800 Turbine Engine Program, Textron Lycoming
Mr. John M. Tascher, Staff Engineer, OASD(P&L)DPSO
Mr. Alan S. Whelihan, Acting Director, Office of Metric Programs, OPTI, U.S. Dept of Commerce

METRICATION–YOUR ROLE NOW !

Discussion and Findings

The new DoDD 4120.18 issued September 14, 1987, requires that elements of new defense systems requiring new design must be done in metric unless approval is given to do otherwise. It also specifies the officials responsible for granting such approvals. The directive now requires the Components to expedite the preparation of needed metric specs & standards. Also discussed was the need for the Services to issue implementing instructions to the Services. Section 5164 of the new Trade and Competitiveness Act signed August 23, 1988, designates the metric system as the preferred system of weights and measures in U.S. trade and commerce. It also requires that each Federal Agency, "by a date certain and to the extent economically feasible by the end of the fiscal year 1992, use the metric system in its procurements, grants, and other business related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to U.S. firms, such as when foreign competitors are producing competing products in non-metric units." The Production Manager for Textron Lycoming for the T800 engine program stated that there was considerable initial concern in designing and building in metric. The Project Office took a hard line of "only Metrics Spoken Here." The inch-pound scales were taken away from designers, and the engineers were educated in metric tolerancing and standards. Inspectors were trained in metric, and all external engine parameters were put out in ISO units. "When the smoke settled, we found that if you approach metrication with common sense, the anticipations and emotions are completely out of proportion to the fact." Textron Lycoming found that the real issues of metrication is making the required adjustments so the metric system can co-exist in a hybrid world. Procurement learned that finding sources for metric hardware was not an issue. "However, lead times were longer, which forced us to adjust." The cost delta was insignificant.

The SAE creates many metric standards. In addition, they are currently preparing about 175 propulsion standards in metric under contract to DISC. These standards will support the LHX T- 800 engine among others. Using seed money from the Services and DLA, this method of expediting the preparation and publication of metric standards is proving very successful.

In a survey of DoD standards preparing activities, we have some preliminary data which shows that about 6 percent of DODISS documents are already metric. Another 4 - 5 percent are not measurement sensitive. There are substantial metric documents available in areas such as fasteners, fiber optics, chemicals, and metal bars, sheets, and shapes. A survey of 10 top DoD contractors asked for a list of documents needing metric versions to support several military weapon systems. A number of general design and general equipment standards such as MIL-STD-454 and specifications were named. Also, there is a need for more metric specs in a number of commodity areas. A large number of existing inch-pound specs with minor modifications are believed to be usable in a metric system. A DoD metric plan to meet the requirements of Section 5164 of the new Act is being developed and will be submitted to the Congress in February, 1989. DoD is developing a priority list of needed metric specs and standards and a data base to help manage the development of these documents. DoD will meet with industry associations to determine who should prepare the new documents.

RECOMMENDATIONS

1. DOD-STD-1476 should be reviewed and revised as needed to ensure compliance with DoDD 4120.18

OPR DPSO

2. DoD should work with the construction industry to develop a plan for eventually transitioning to metric standards.

OPR DPSO

PANEL MEMBERSHIP - PANEL 1, SESSION B

METRICATION - YOUR ROLE NOW

AUGUST 22, 1988

COL. TOM MANSPERGER	OFFICE OF STANDARDIZATION AND DATA MANAGEMENT
MR. ALAN WHELIHAN	OFFICE OF METRIC PROGRAMS, U.S. DEPT OF COMMERCE
MR. DAVID BENTLEY	SAE
MR. G.R. MARKHAM	TEXTRON LYCOMING
MR. JOHN TASCHER	DEFENSE PRODUCT STANDARDS OFFICE

DOD METRIC POLICY

NEW NATIONAL POLICY

SAE PROPULSION STANDARDS

LHX EXPERIENCE

NEEDED METRIC DOCUMENTS

DODD 4120.18 -- SEPT 87

APPROVAL NEEDED FOR NONMETRIC

SDIO DECISION

CHICKEN OR THE EGG ?

TOP TEN SURVEY (87 $ VOL)

RESULTS OF TOP TEN SURVEY

MCDONNELL DOUGLAS:

GENERAL DYNAMICS:

WILL REPLY BY SEPTEMBER 1

BOEING:

CITED ABOUT 2600 DOD AND INDUSTRY DOCUMENTS
CITED ABOUT 300 COMPANY STANDARDS
PROLIFERATION OF INCH-POUND STANDARDS
GOVERNMENT SHOULD FUND ASSOCIATION EFFORT

GRUMMAN:

120 SYSTEM LEVEL DOCUMENTS FOR F-14
31 SYSTEM LEVEL DOCUMENTS FOR BOOST SURVEILLANCE TRACKING SYSTEM

UNITED TECHNOLOGIES:

RESULTS OF TOP TEN SURVEY (CONT'D)

MARTIN MARIETTA:

MANY ELECTRONICS SPECS NEED SOFT CONVERSION ONLY
MOST FASTENER SPECS ALREADY CONVERTED
CITED 12 SPECS AS TYPICAL

RAYTHEON:

EXPRESSED CONCERNS
PREFERS COMBINATION OF METRIC AND INCH-POUND

GENERAL MOTORS:

HUGHES AIRCRAFT LISTED 222 INDUSTRY AND 1350 MILITARY/FEDERAL SPECS AND STANDARDS

LOCKHEED:

GENERAL ELECTRIC:

CITED 22 SPECS NEEDED FOR AN AVIONICS UNIT

A Metric America

- A Decision Whose Time Has Come -

When our founding fathers wrote the Constitution of the United States, they did not overlook the need to fix the standard for weights and measures but Congress has only now established an official system of units. Almost two centuries after the Constitution was written a 1971 study conducted by the National Bureau of Standards carried the title "A Metric America - A Decision Whose Time Has Come". In his letter forwarding the study to the Congress, Secretary of Commerce Maurice Stans stated his agreement with the study and set forth in his letter nine specific recommendations contained in the study. The recommendations were:

The Congress attempted to implement all of these recommendations in legislation in a 1973 metric conversion bill which was defeated on the floor of the House. By 1975, a revised bill was passed and signed into law initiating what most citizens thought would be conversion of the United States to use of the metric system. The primary change in the 1975 law from the 1973 bill was the removal of two of the earlier bill's most important provisions: 1) that the Nation's conversion be accomplished within ten years, and 2) that there be a firm government commitment to this goal. These deletions proved to be serious flaws indeed.

The U.S. Metric Board, created by the Metric Conversion Act of 1975, was an independent agency charged with "coordinating the voluntary conversion to the metric system." Although authorized in the 1975 law, the Metric Board members were not appointed and confirmed by the Senate for almost three years. This delay probably eroded public confidence in the "government commitment" to the metric changeover. Some of the Board appointments that were finally made should have suggested trouble ahead. Among the appointees were those who had led the organized labor opposition to the stronger 1973 bill and whose commitment to metric change was at best questionable.

In its meeting in San Francisco on August 16, 1979, the Metric Board debated the issue of its own leadership role for the conversion process. After much rancorous discussion, the Board finally adopted two resolutions. One resolution was an interpretation of the National policy on metric stated in the law. The second resolution was an explanation of the "Role of the United States Metric Board." In the first resolution the Board stated that the Congress committed the Nation and the Government only to "taking steps to coordinate the increasing voluntary use of the metric system." The word "voluntary" received so much emphasis in this resolution and in later statements and actions of the Board, as to raise doubts regarding the Government commitment to the change to metric.

The second resolution set the stage for the Board's subsequent activities which were in essence in three areas of activity -- public awareness, research and coordination and planning. Let me summarize the work carried out in these areas:

1. Public awareness - This activity eventually evolved into merely publicizing the existence of the Metric Board, and emphasizing the entirely voluntary aspect of the metric program. Minor emphasis was placed on education and on familiarizing the general public with what the metric system technically was. No programs of education or instruction about use of the metric system were conducted. The intrinsic merit and the need for conversion to enhance efficiency and competitiveness in the U.S. economy received surprisingly little attention.

2. Research - This activity was comfortable work for the Board. Contract studies examined specific issues set forth in the Act which had been identified as possible problem areas, including possible difficulty with changing laws and regulations which contained English measurement units. Other areas of concern which were researched included possible adverse economic impact of metric change on workers, (cost of tools and training), certain occupations and industries, small business and the international trade position of the U.S. Generally, the research studies of actual conversions to metric concluded that metric change was accomplished with little difficulty or lasting adverse impact.

3. Coordination and Planning - The Metric Board chose not to directly sponsor or actively manage metric conversion planning or coordination activity. The Board chose to rely on spontaneous production and submission of plans by industry, education, government and all other elements of the U.S. economy and society. With regard to industry plans, the Board stated on numerous occasions its support of the work of the American National Metric Council (ANMC). Although the Board developed procedures for review and acceptance of ANMC sponsored industry sector metric conversion plans, it would not agree to approve or promote development of such plans. In the end, only two plans were formally submitted to the Board. These plans were received during the last few months of the Board's operation and covered only "instruments" and industrial chemical packaging.

To summarize, the record of the U.S. Metric Board shows that it failed to actively lead and promote a National transition to general use of the metric system. On the positive side -- its research showed that there was little merit to the most frequently used arguments of the anti-metric forces. It thereby removed some impediments to the change. Another useful initiative of the Metric Board was the establishment of Federal and state committees to coordinate and exchange information about metric change.

Because of the Metric Board's inability to provide leadership, metric activity in U.S. commerce and industry soon became completely independent of the actions of the Board. But rather than accelerating under private initiative, metric changeover activity became a matter of low priority.

Although the Metric Board was not providing leadership, public commitment and support for metric activity declined even further when the Metric Board shut its doors in September 1982. Undoubtedly, what was intended as our economy move was viewed as the government itself backing away from its metric program. This led to further back pedaling on metric, particularly in areas where there was no obvious direct economic benefit or competitive necessity to change.

As we have observed the scene over the past few years, it is apparent that there is confusion as to where metrication is headed and there is also a general lack of awareness of the added expense and lost opportunities associated with our protracted use of two systems. If our citizens realized that we in the U.S. are paying a very high price for our failure to complete the metric transition, I am confident they would support the move to accelerate our use of the measurement system the rest of the world accepted long ago. One of the most serious costs of the metric slowdown is in education. International tests of 8th and 12th graders' measurement skills reveal a shockingly poor performance by U.S. students. One of the ironies in this situation is that the students and the teachers are aware of the problem. Their letters to us are overwhelmingly pro-metric and they are impatient with the rest of us. They even understand the trade and economic reasons for the change to metric.

Despite the realization among most citizens that we are only postponing an inevitable change, there has been an almost universal reluctance for anyone in a leadership role to take up the metric cause. Fortunately, one Congressman and one Senator accepted the fact that it was up to the Congress to clarify the uncertainty about our National metric policy by amending the Metric Conversion Act and directing the Federal Government to lead the way to metric. The Metric Conversion Act of 1975 has now been amended to designate metric as our preferred system for commerce and industry and the Federal Government, assisted by the Department of Commerce and the ICMP, is directed to lead the way through in metric usage in grants, contracts and other business purposes. With Federal leadership we can now expect to see the long delayed metric change accomplished. It will be necessary for all Federal Departments and Agencies to clearly communicate the reasons for the metric change to their specific clients and constituencies. Our citizens, when properly informed, will realize that there is much to gain by supporting the change to metric.

The new metric amendments and the pertinent House-Senate Conference Committee report section are attached.

Attachment

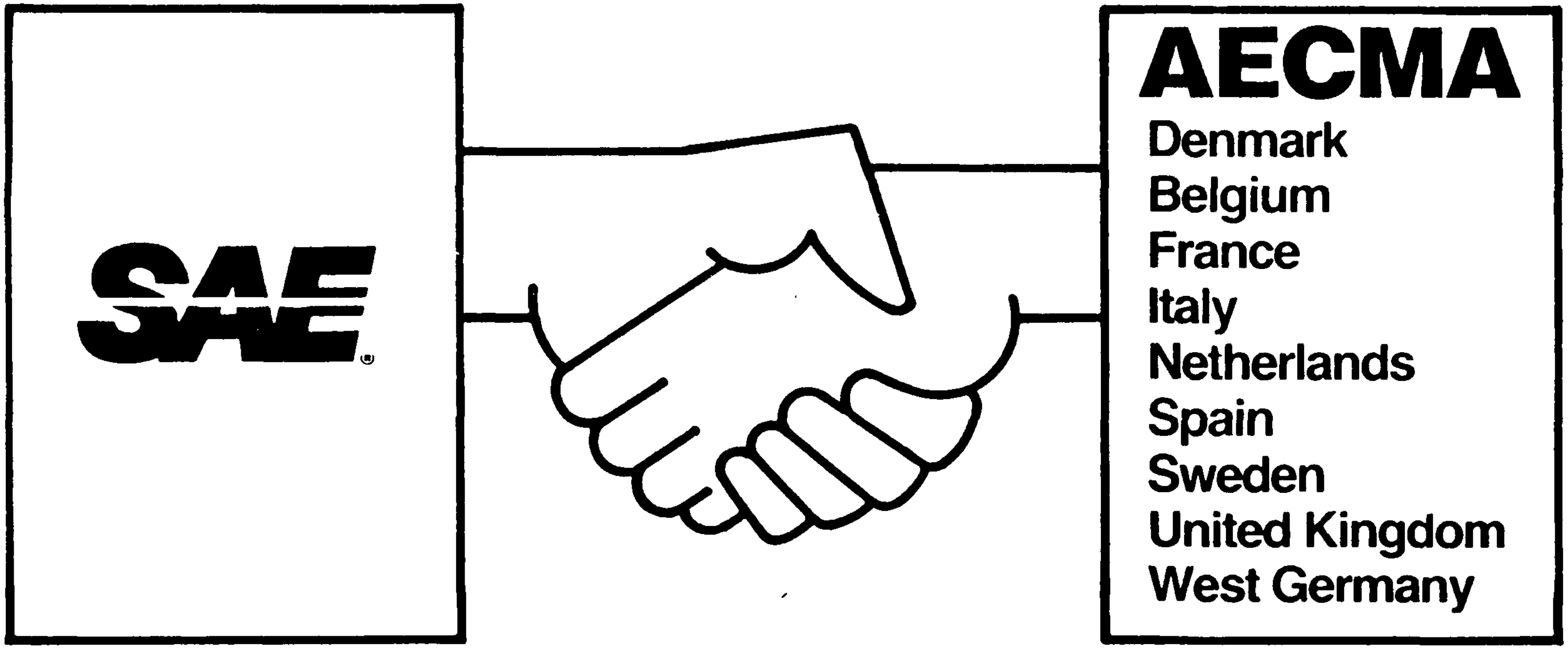
DOD PRESENTATION ON

SAE'S METRICATION PROGRAM

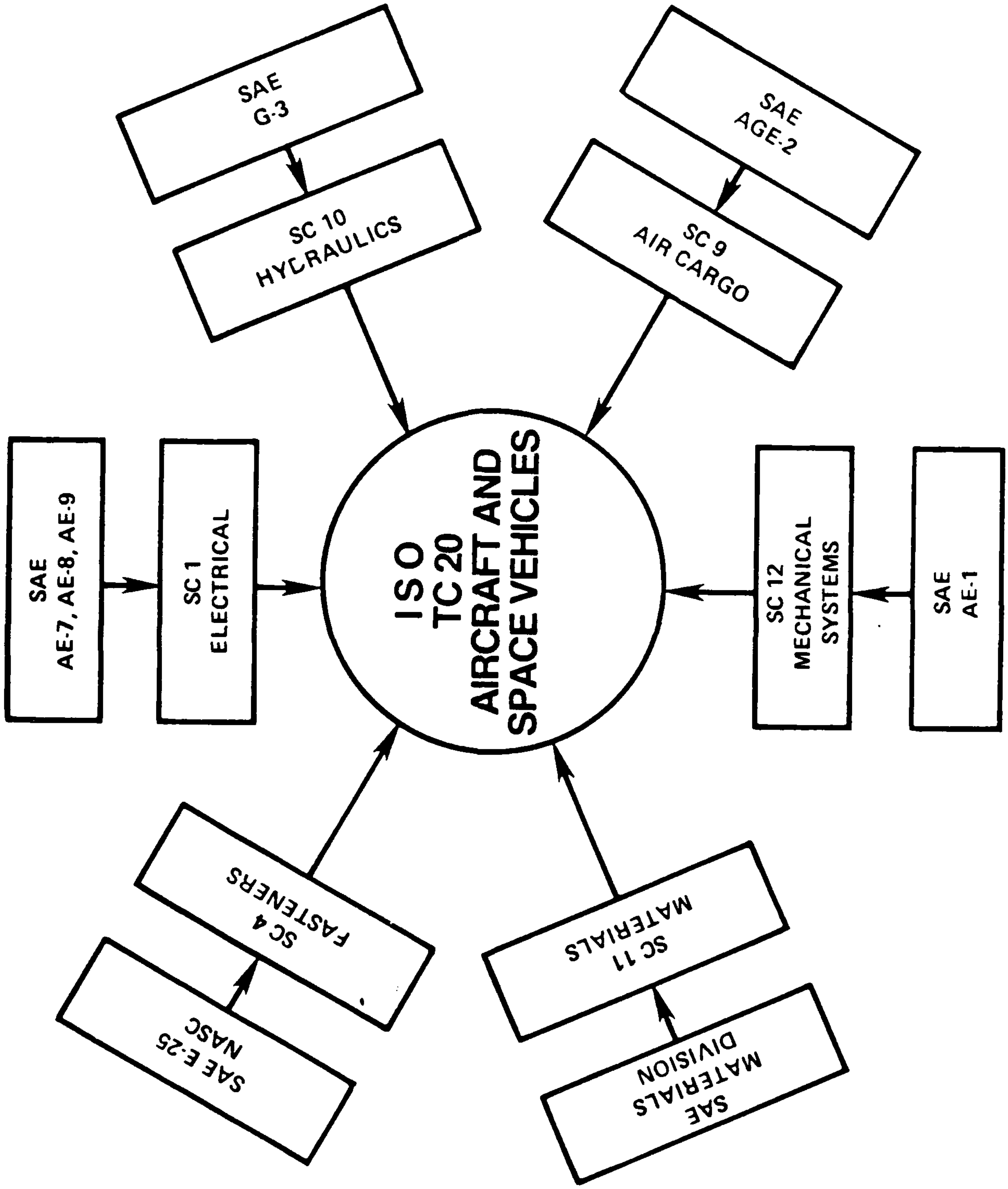
GIVEN BY: DAVID R. BENTLEY, MANAGER,
AIR & SPACE TECHNICAL DIVISION
SOCIETY OF AUTOMOTIVE ENGINEERS, INC.

U.S. AEROSPACE METRIC STANDARDIZATION STATUS AND FUTURE

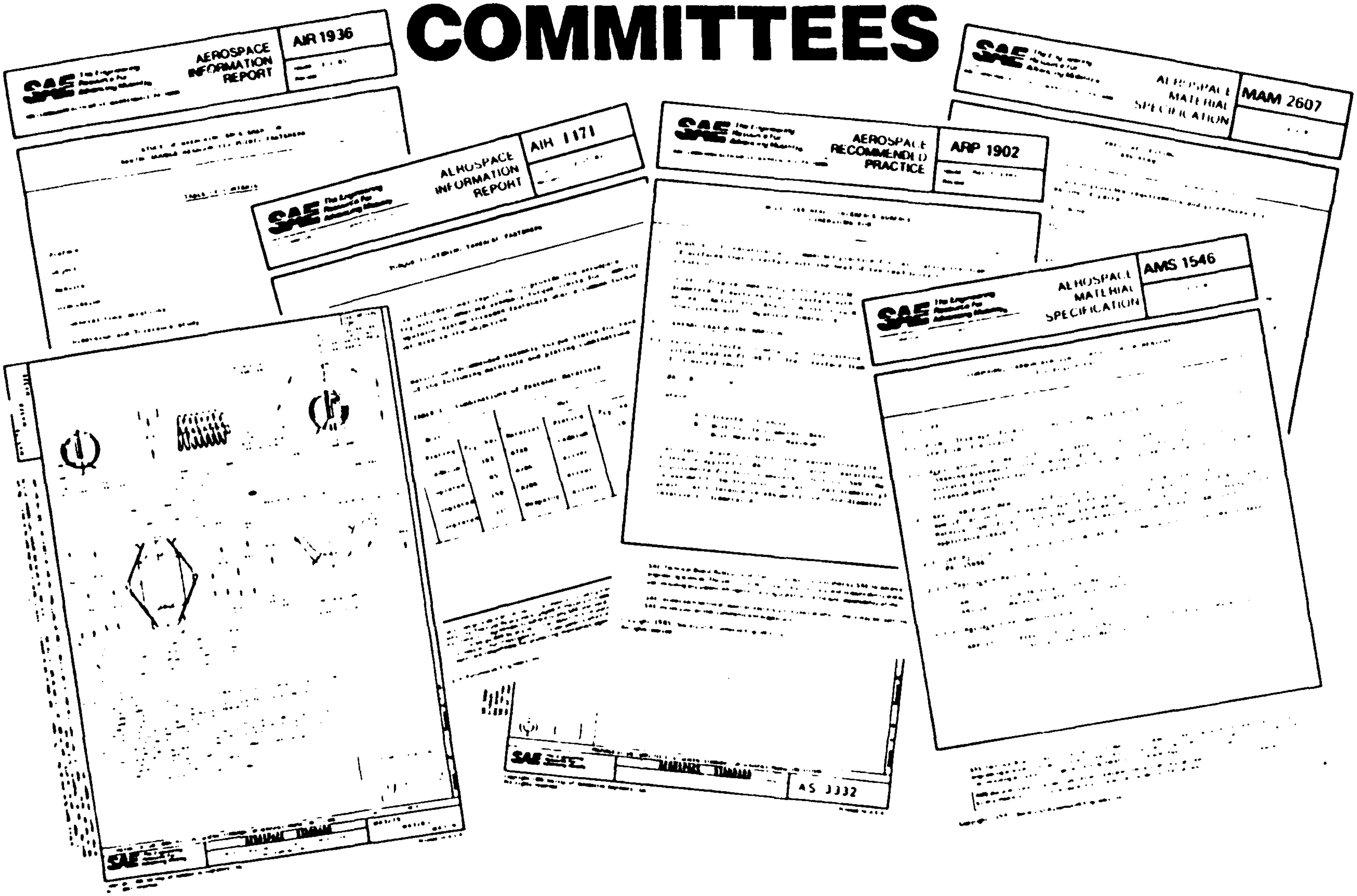
SAE/AECMA HARMONIZATION



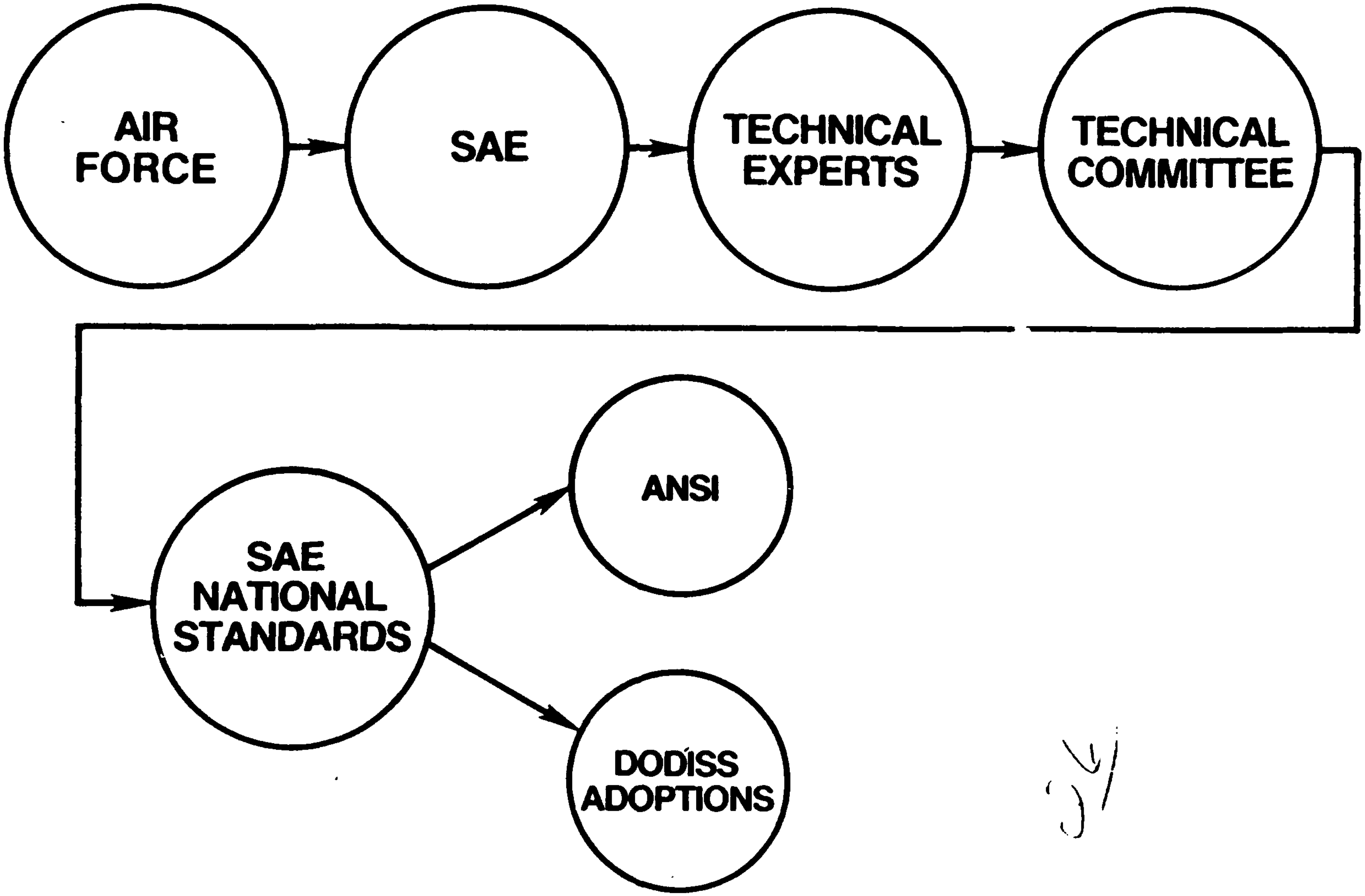
TRACK RECORD OF COOPERATION IN AEROSPACE


ISO
TC 20
AIRCRAFT AND
SPACE VEHICLES
SAE
G-3
SC 10
HYDRAULICS
SAE
AGE-2
SC 9
AIR CARGO
SAE
AE-7, AE-8, AE-9
SC 1
ELECTRICAL
SC 12
MECHANICAL
SYSTEMS
SAE
AE-1
SC 4
FASTENERS
SAE E-25
NASC
SC 11
MATERIALS
SAE
MATERIALS
DIVISION

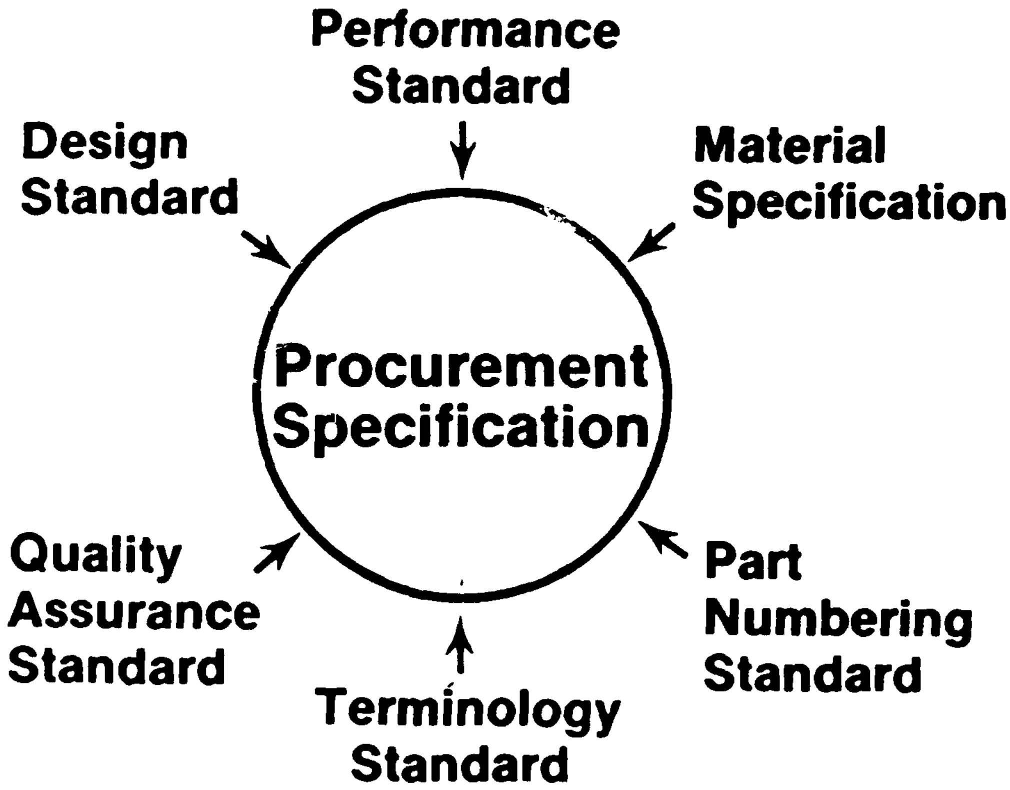
STANDARDS PRODUCED BY SAE AEROSPACE COUNCIL COMMITTEES



SAE/AIRFORCE CONTRACT

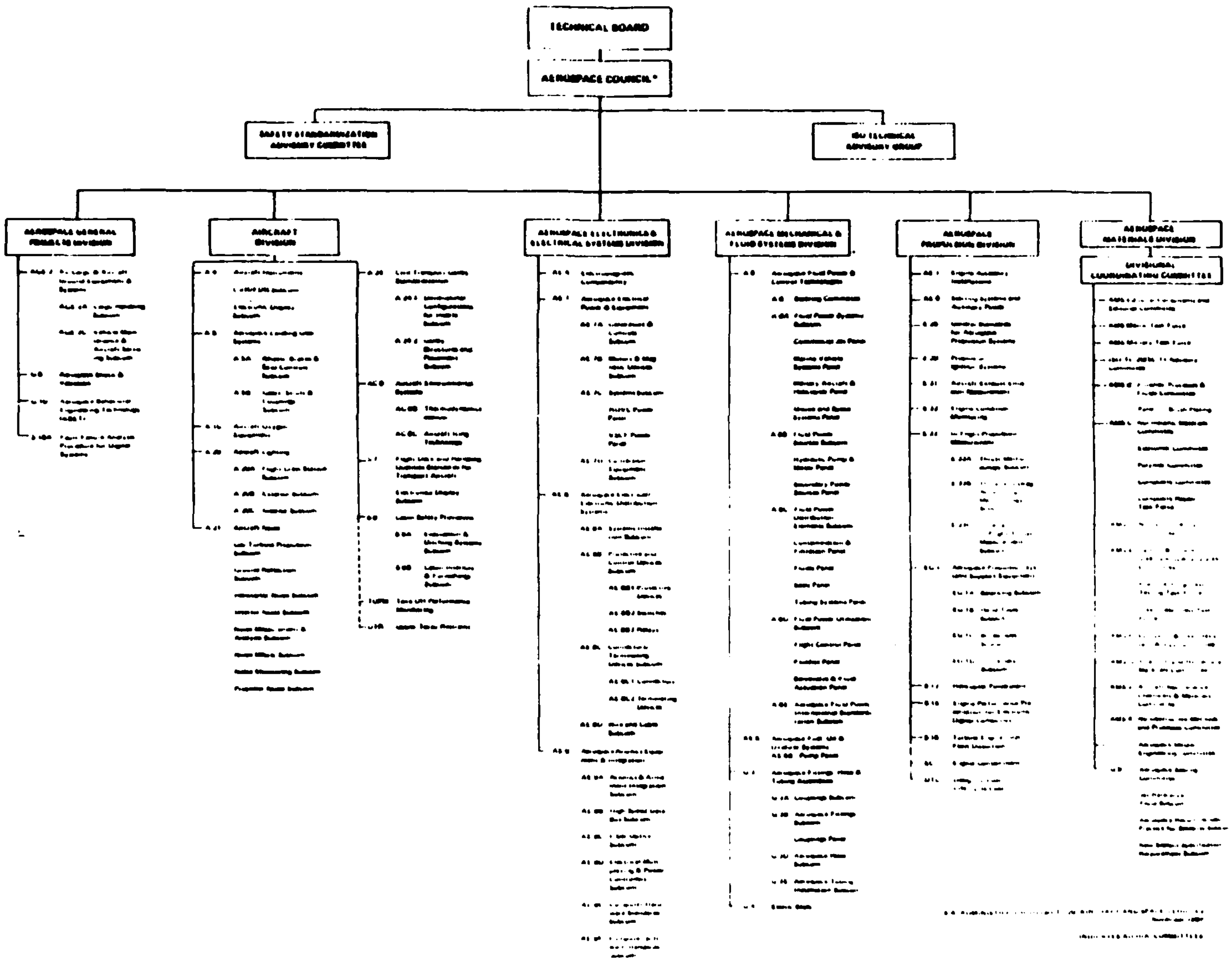


PROCUREMENT DOCUMENTS



USER ORIENTATION

SAE Aerospace Council Organization Chart



ISO/TC 20

- SC 1, Aerospace Electrical Requirements
- SC 4, Aerospace Fasteners
- SC 5, Aircraft Environmental Equipment and Operating Conditions
- SC 8, Aerospace Terminology
- SC 9,*Air Cargo and Ground Equipment
- SC 10,*Aerospace Fluid Systems and Components
- SC 11, Aerospace Materials Requirements
- SC 12, Mechanical System Parts

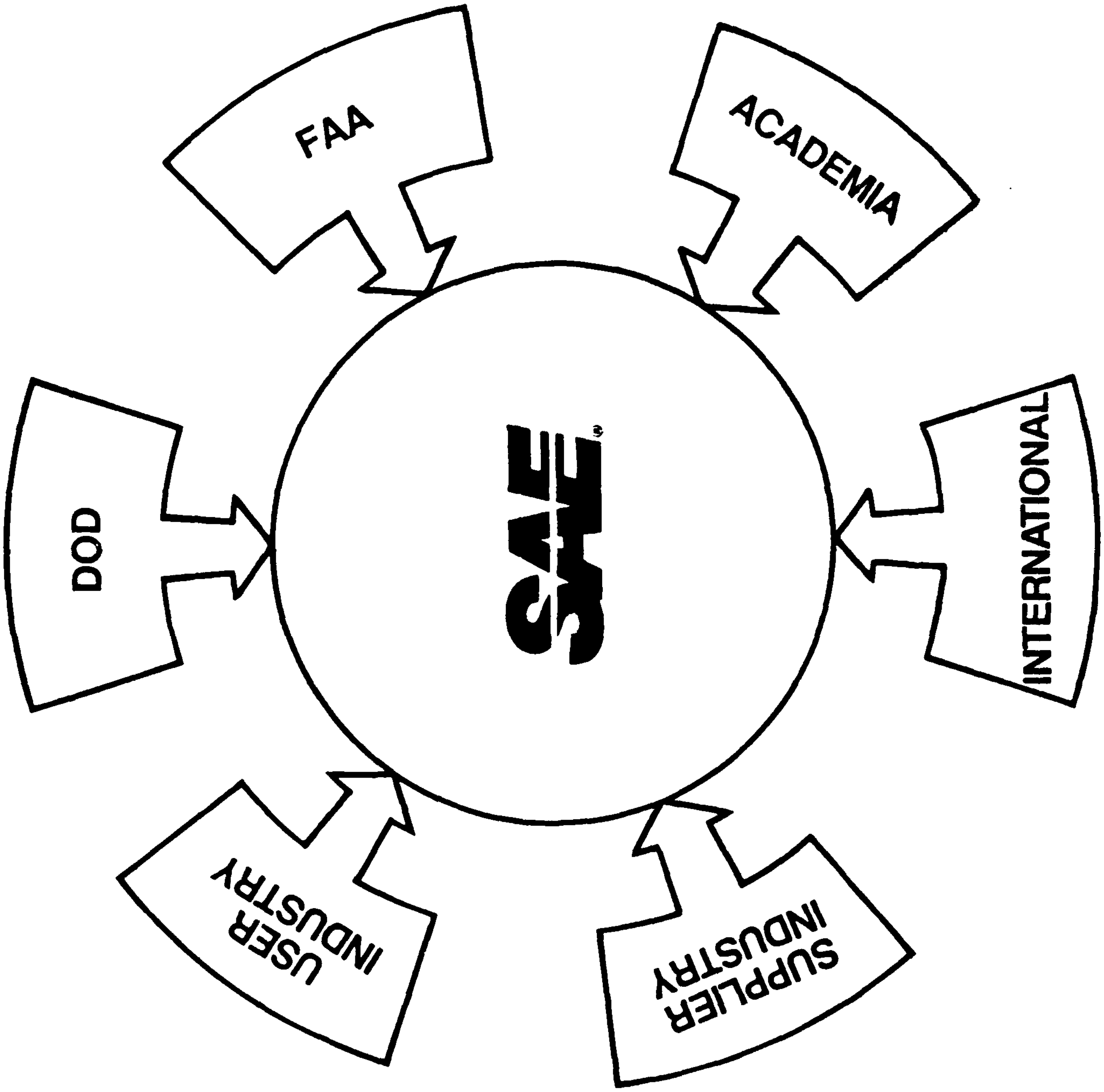
*International Secretariat

MILITARY INVOLVEMENT

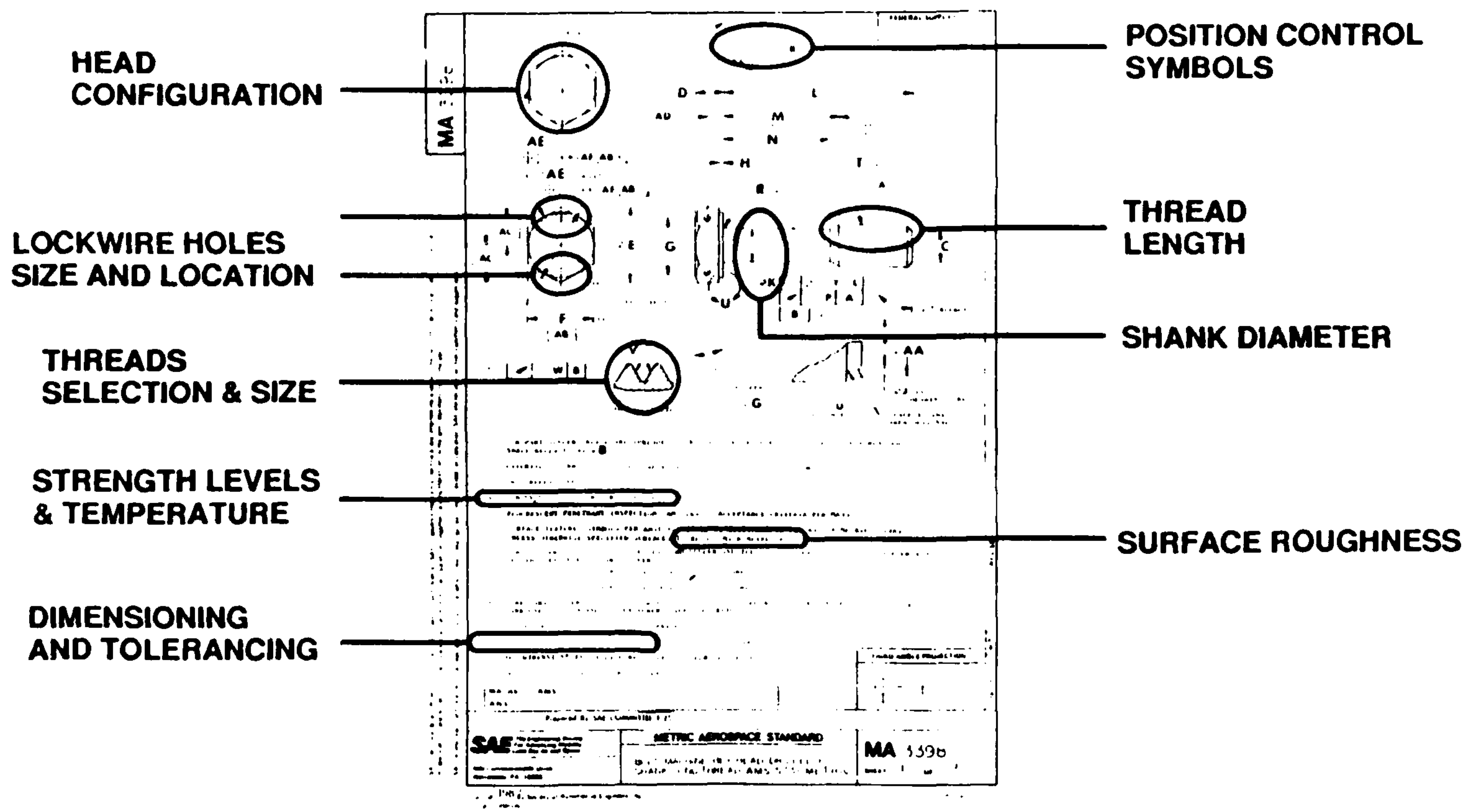
- 600 DOD Employees Participate
- XXXX DODISS Accepted Standards
- Review and Drafting of Military Standards

ALTERNATIVES TO U.S. NATIONAL STANDARDS

Company Standards	— Cost, Uncoordinated, Single Source, Proliferation
Military Standards	— Time Constraints, MIL Standard 143, OMB A119
Foreign Standards	— Loss of Control, Market Disadvantage
ISO Standards	— Loss of Control, Slow Production, No Current Emphasis on Part Standards


SAE
FAA
ACADEMIA
DOD
INTERNATIONAL
USER
INDUSTRY
SUPPLIER
INDUSTRY

STANDARD DEVELOPMENT THROUGH USE OF ISO BUILDING BLOCKS



STANDARDS DEVELOPMENT CONSTRAINTS

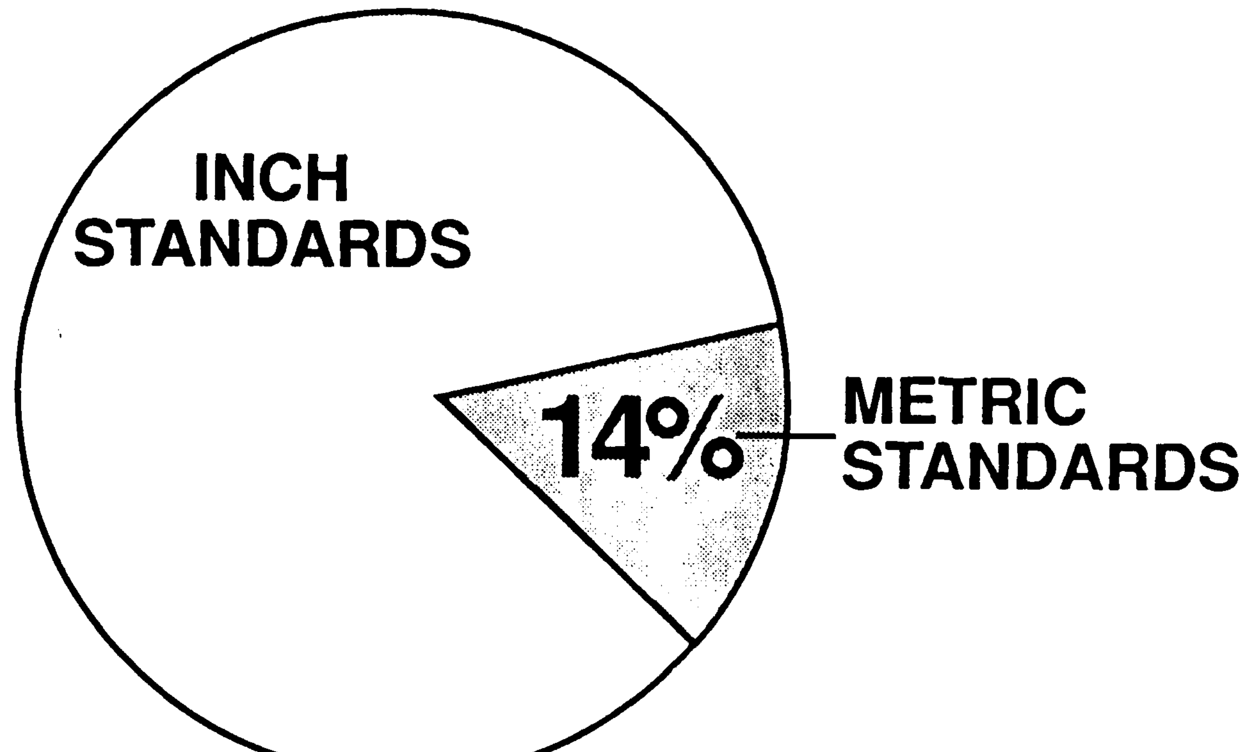
- Committees meet only twice a year.
- Members lose interest if project is not immediately applicable to their work.
- DOD acceptance is slow process.
- Many standards are for non-existing parts not yet qualified.
- All ISO building blocks are not yet completed.
- The U.S. does not agree with all of the existing building blocks.

SAE/DISC METRICATION CONTRACT

Benefits:

- U.S. National Documents have international recognition and distribution.
- DOD has access to pool of industry experts.
- Relatively short development & approval time.
- Routine 5 year review.
- Development of cadre of U.S. metric standards for future programs.
- Positive impact on European regional standardization activity.

CURRENT PUBLISHED SAE STANDARDS *(ENGINE FASTENERS)*



RECOMMENDATIONS

- Continue to coordinate with European standards bodies.
- Speed up DOD adoption process.
- Continue to increase productivity of technical committees.
- Finish the job.

SAE AEROSPACE METRIC STANDARDS

	1984	1985	Present (May 88)	Future
Parts, Design, Practices	38	38	145	> ?
Material Specifications	29	34	50	> ?
Total	67	72	195	

SAE/DISC
METRICATION CONTRACT

41 DOCUMENTS PUBLISHED

5 DOCUMENTS COMPLETED
(awaiting publication)

46 DOCUMENTS IN PROCESS

GOOD AFTERNOON

I'M JERRY MARKHAM, PRODUCTION MANAGER FOR TEXTRON LYCOMING FOR THE T800 ENGINE PROGRAM.

AS MOST OF YOU KNOW, TEXTRON LYCOMING AND PRATT & WHITNEY ARE TEAMED AS A JOINT VENTURE TO DEVELOP THE T800 ENGINE. OUR ENGINE IS CURRENTLY COMPETING TO BE THE POWER OF LHX. WE HAVE RECENTLY COMPLETED A COMPETITIVE THREE-YEAR DEVELOPMENT PROGRAM AND ARE WAITING FOR THE SOURCE SELECTION BOARD TO AWARD A FOLLOW-ON PRODUCTION CONTRACT IN OCTOBER.

HAVING THE DISTINCTION OF BEING INVOLVED IN THE DEVELOPMENT AND PRODUCTIONIZATION OF ONE OF THE FIRST FULLY METRIC GAS TURBINE ENGINES IN THE UNITED STATES, I WOULD LIKE TO SHARE WITH YOU OUR APPROACH TO METRICATION, SOME LESSONS LEARNED, AND BECAUSE WE ARE A SUCCESS STORY, DISPEL ANY RUMORS THAT DEAL WITH METRICS. <u>(VIEWGRAPH 1)</u>

I'D BE SPEAKING HALF-TRUTHS IF I WOULD STAND IN FRONT OF YOU TODAY AND CLAIM WE HAD NO APPREHENSIONS ABOUT BUILDING A METRIC ENGINE. IN FACT, WE WENT METRIC BECAUSE WE HAD NO CHOICE.

THE RFP FOR THE T800 REQUIRED A "HARD METRIC" ENGINE. WE HAD NO TIME FOR DEBATE. IT WAS CLEAR THAT THE T800 WAS THE ONLY BALLGAME IN TOWN. IF WE WANTED TO PLAY BALL, WE HAD TO PLAY WITH A METRIC BAT OR GO HOME. INITIALLY THE REACTION WAS NOISY - - PERHAPS THIS VIEWGRAPH SUMS IT UP BEST. <u>(VIEWGRAPH 2)</u>

LET ME SUMMARIZE OUR APPROACH. <u>(VIEWGRAPH 3)</u>
IN THE PROJECT OFFICE WE ESTABLISHED A HARD LINE OF "ONLY METRICS SPOKEN HERE". WE LITERALLY TOOK THE ENGLISH SCALES AWAY FROM THE DESIGNERS, PRESSED THE METRIC BUTTON ON THE CAD SYSTEM, AND BEGAN TO EDUCATE OURSELVES ON METRIC TOLERANCING AND STANDARDS. WE ORDERED METRIC MICROMETERS, VERNIERS AND GAGING, AND SET ABOUT THE TASK OF TRAINING OUR INSPECTORS.

IN THE TEST AND PERFORMANCE AREAS, WE CONVERTED DIAL FACES AND PROGRAMMED COMPUTERS SO THAT ALL EXTERNAL ENGINE PARAMETERS WERE OUTPUT IN ISO UNITS.

PROCUREMENT WENT ABOUT FINDING APPROPRIATE METRIC SUPPLIERS. WE FOUND A SMALL MACHINE SHOP CLOSE TO LYCOMING THAT HAD BEEN DEALING EXCLUSIVELY IN METRICS FOR YEARS. THEIR HELP AND INSIGHT WAS INVALUABLE.

WHEN THE SMOKE SETTLED, WE FOUND THAT IF YOU APPROACH METRICATION WITH COMMON SENSE, THE ANTICIPATION AND EMOTION ARE COMPLETELY OUT OF PROPORTION TO THE FACT.

WE FOUND ORCHESTRATING THE DESIGN, PROCUREMENT AND TESTING ACTIVITIES OF A JOINT VENTURE, AND MAINTAINING COMMUNICATION AND INTEGRATING CULTURE BETWEEN PRATT AND LYCOMING PLANTS IN MONTREAL, WEST PALM BEACH AND TWO LOCATIONS IN CONNECTICUT, FAR SURPASSED THE TASK OF METRICATION.

WITHIN TWELVE MONTHS AFTER CONTRACT AWARD, WE RAN OUR FIRST GAS GENERATOR. (VIEWGRAPH 4)

SINCE THEN WE HAVE LOGGED SEVERAL THOUSAND HOURS ON OUR ENGINES AND ARE INVOLVED IN THE PRELIMINARY FLIGHT RATING TEST. MOST RECENTLY WE HAVE VALIDATED OUR PRODUCTION SYSTEMS BY MANUFACTURING PILOT PRODUCTION, METRIC PARTS.

I PREVIOUSLY SAID THAT THE BEST CURE FOR PROBLEMS WHICH ARISE DUE TO METRICATION IS COMMON SENSE. METRICS IS NEITHER A RELIGION NOR A POLITICAL PHILOSOPHY - - IT'S SIMPLY A TOOL - - AND LIKE ANY GOOD TOOL, YOU WILL, ON OCCASION, HAVE TO ADAPT IT; WHICH BRINGS ME TO THE LESSONS LEARNED.

(VIEWGRAPH 4A)

PROBABLY THE GREATEST MISCONCEPTION ABOUT METRICATION IS THAT IT IS COSTLY. A STUDY ON LHX COST RESULTING FROM METRICATION CONDUCTED BY SCIENCE APPLICATIONS INTERNATIONAL CORPORATION FOR THE BELVOIR RESEARCH DEVELOPMENT AND ENGINEERING CENTER CONCLUDED THAT "THE COST TO METRICATE THE LHX, EVEN AT THE UPPER LIMIT, IS CONSIDERED INSIGNIFICANT IN RELATION TO THE TOTAL PROGRAM COST". THAT COST WAS .28 OF 1% OVER THE BASELINE COST OF THE ENTIRE PROGRAM. OUR COST, FOR THE ENGINE ALONE, WAS LESS THAN THAT.

WE FOUND THE REAL ISSUE OF MERICATION IS MAKING THE REQUIRED ADJUSTMENTS SO THE METRIC SYSTEM CAN CO-EXIST IN A HYBRID WORLD -- TO COHABITATE FACILITIES, EQUIPMENT, INVENTORIES, COMPUTERS USING ENGLISH SYSTEMS, ETC. FOR EXAMPLE, WITH RESPECT TO TEST CELLS, LYCOMING HAD TO INTEGRATE A METRIC TEST CELL INTO ITS MULTI-PURPOSE FACILITIES.

WE HANDLE ALL DEVELOPMENT AND PRODUCTION TESTING IN 34 CELLS LOCATED ON-SITE IN OUR STRATFORD PLANT. HOWEVER, WITH APPLICATIONS THAT VARY FROM T53'S AND T55'S IN HELICOPTERS, TO THE TF40 IN A NAVY HOVERCRAFT, THE AGT-1500 IN THE M1 TANK, AND THE ALF 502 IN TRANSPORT AIRPLANES, SANDWICHING IN A METRIC ENGINE BARELY MADE A RIPPLE.

EQUIPMENT WAS MODIFIED USING METRIC DRO'S AND PROCESSES WERE IN METRIC. WE PROVIDED TWO FOUR-HOUR TRAINING SESSIONS FOR OUR SUPERVISORS AND OPERATORS. ONCE THEY FELT COMFORTABLE WITH METRIC TOLERANCES A NUMBER BECAME A NUMBER.

PROCUREMENT LEARNED THAT FINDING SOURCES FOR METRIC HARDWARE WAS NOT AN ISSUE. HOWEVER, LEAD TIMES WERE LONGER, WHICH FORCED US TO ADJUST.

AS I PREVIOUSLY SAID, WE TOOK A HARD LINE WITH DATA - - METRICS ONLY. HOWEVER, BURIED WITHIN OUR COMPUTER SOFTWARE WERE THOUSANDS OF ENGLISH CONSTANTS, PROPERTIES, CALCULATIONS AND SIMULATION TECHNIQUES, RESULTS OF THEORY, NATURAL LAW AND EMPIRICAL STUDIES.

HOW DID WE DEAL WITH THIS? WE MADE CONVERSIONS THROUGH PRE- AND POST PROCESSING. SOME OF YOU PURISTS MAY BE OFFENDED BY THIS, BUT IT WAS EXPEDIENT, ACCURATE, INEXPENSIVE AND IT WORKED.

IN ORDER TO LIMIT CONFUSION WITH BOLT SIZES AND REDUCE THE TOOLS REQUIRED FOR MAINTENANCE, WE DESIGNED A SINGLE SIZED METRIC BOLT WITH DISTINCTIVE HEAD FOR THE ENTIRE ENGINE. (VIEWGRAPH 5)

(VIEWGRAPH 6)

I CAN GIVE YOU SEVERAL TEXT BOOK REASONS WHY MAKING THE T800 ENGINE METRIC IS BENEFICIAL TO TEXTRON LYCOMING AND THE U.S. ARMY:

- o BROADER LOGISTICAL SUPPORT BASE
- o STANDARDIZATION OF HARDWARE
- o SIMPLICITY IN MEASUREMENT
- o FEWER RESOURCES REQUIRED FOR PROCUREMENT, HANDLING, STOCKING, DISTRIBUTING, OPERATING AND MAINTAINING OF FEWER SYSTEMS

BUT THE ONE I LIKE THE BEST IS THE METRIC ENGINES ABILITY TO PROVIDE A BROADER BUSINESS BASE. ONE TRIP AROUND THE PAVILION AT THE PARIS AIR SHOW WOULD HAVE CONVINCED YOU THAT AMERICAN AIRCRAFT WILL HAVE TO EARN THEIR WAY INTO AN INCREASINGLY COMPETITIVE EUROPEAN MARKET PLACE. HOWEVER, WITH THE GOVERNMENT'S "NEW WAY" OF DOING BUSINESS - - WITH CORPORATE CONTRIBUTION AND INCREASED FINANCIAL RISKS TO INDUSTRY WROUGHT BY LIFE CYCLE COST GUARANTEES AND FIRM FIXED PRICED CONTRACTS, I WELCOME ANYTHING THAT WILL GIVE OUR T800 SOME ATTRACTION TO THE WORLD MARKET.
BY THE WAY, WE DISPLAYED OUR ENGINE AT THE PARIS AIR SHOW. I THOUGHT THIS REACTION WAS RATHER EMPHATIC. (VIEWGRAPH 7)

I'VE USED THE TERM "HYBRID WORLD" TO DEFINE THE METRIC AND ENGLISH STANDARD WORLD WE LIVE IN. CAN WE LIVE IN A HYBRID WORLD? WE ALREADY DO, BUT MUST WE PERPETUATE IT?

MY FIRST ENCOUNTER WITH THIS HYBRID WORLD WAS ONE NIGHT SEVERAL YEARS AGO WHEN I TRIED TO CHANGE A FAILED STARTER ON MY 1979 CHEVY. SOME PROPONENT OF THE HYBRID WORLD DESIGNED THE STARTER SUCH THAT THE NUTS THAT HELD ON THE RELAY WIRES WERE METRIC. IT TOOK ME A WHILE TO FIGURE OUT WHY MY WRENCHES WOULDN'T FIT. IT WAS VERY COLD, 12°F (NOT C), AND VERY DARK. I HAD TO STOP FREQUENTLY TO TAKE THE FLASHLIGHT OUT OF MY MOUTH TO REST MY JAW MUSCLES. I WAS NOT VERY HAPPY - BUT NO ONE WAS SHOOTING AT ME!

I NEXT HEARD ABOUT THE HYBRID WORLD WHEN TWO PILOTS DEAD-STICKED A 757 TO A SAFE LANDING FROM 40,000 FEET BECAUSE SOMEONE CONFUSED LITERS WITH GALLONS - - BUT NO ONE WAS SHOOTING AT THEM!

WHEN I LOOK AT THE THREE NEW AIRCRAFT WEAPONS SYSTEMS TODAY - - THE ATF, THE V-22, AND THE LHX - - AND ONLY THE LHX HAS STEPPED UP TO METRICS - I ASK MYSELF WHY?

IF WE PLAN TO REMAIN PARTNERS WITH OUR EUROPEAN ALLIES AND WISH TO EXPLOIT COMMONALITY TO ITS MAXIMUM STRATEGIC AND TACTICAL ADVANTAGE, METRICS MUST BECOME A DOMINANT STANDARD.

WEAPON SYSTEMS HANG AROUND FOR A LONG TIME. THE LHX IS PROJECTED TO BE IN THE INVENTORY FOR 33 YEARS. THE UH-1 ENTERED PRODUCTION IN THE 60'S, AND ITS LIFE IS PROJECTED OUT BEYOND THE YEAR 2000.

IF WE START METRICATION TODAY, AMERICAN SERVICEMEN WILL HAVE TO BE CONVERSANT AND FACILE IN TWO MEASUREMENT SYSTEMS FOR AT LEAST ANOTHER TWO GENERATIONS - - AND SOONER OR LATER PEOPLE WILL BE SHOOTING AT THEM!

T800-APW-800

A METRIC SUCCESS STORY

1988 DOD STANDARDIZATION
AND
DATA MANAGEMENT CONFERENCE

CH1610-10
TEXTRON Lycoming

"IF CONFUSION WAS CONCRETE,

METRICS WOULD BE A SUPER HIGHWAY"

UNKNOWN
UNEDUCATED

CH1611-10

WHAT DO YOU DO WITH A METRIC ENGINE?

CH1612-10

T800-APW-800 METRICATION APPROACH

Project Office

- Only Metrics Spoken
- Designers English Scales were Replaced Metric Scales
- CAD Systems were Converted to Metrics
- Metric Micrometers, Verniers and Gages Used
- Inspectors Trained in Metrics

Test and Performance

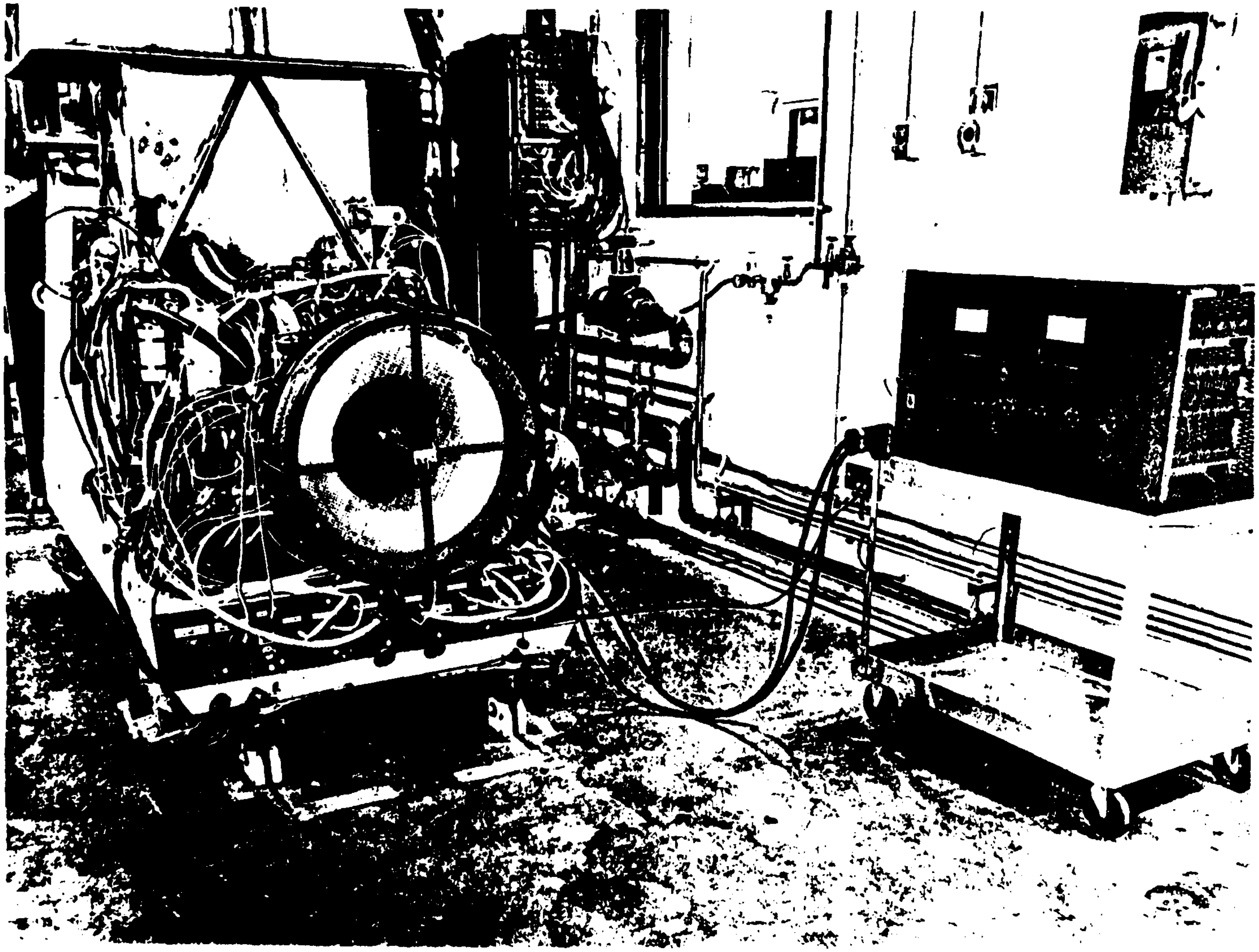
- Dial Faces Converted
- Computers Programmed so that all External Engine Parameters were Output in ISO Units

Procurement

- Found Appropriate Metric Suppliers

CH1613-10

T800 TEST CELL INSTALLATION



CE1245-4

T800-APW-800 LESSONS LEARNED

- The Cost to Metricate the LHX is Insignificant in Relation to the Total Program Cost

- Problems Exist when a Metric System Trys to Co-Exist in a Hybrid World

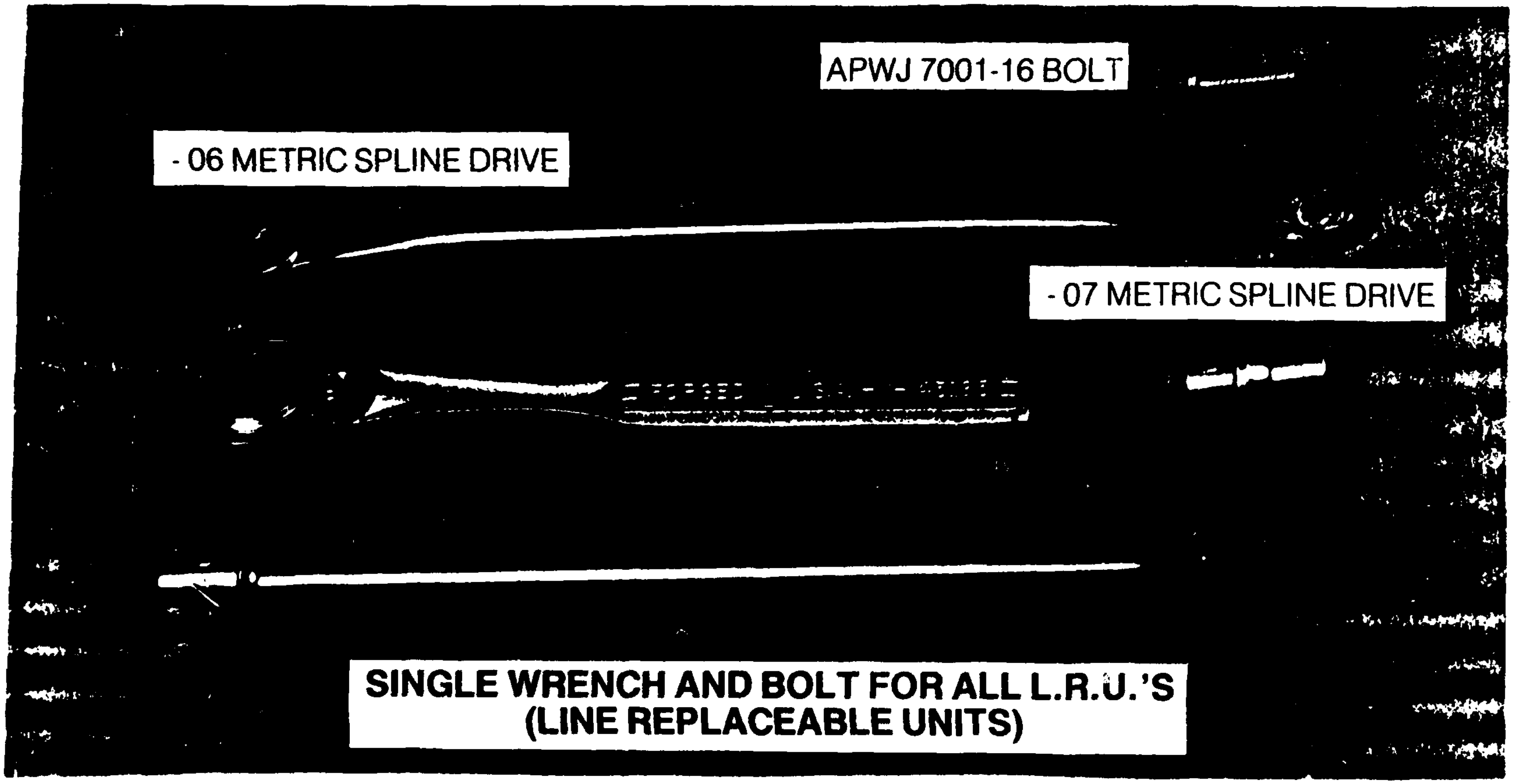
CH1614-10

TEXTRON LYCOMING PRATT & WHITNEY

T800-APW-800
Critical Design Review
14-18 December 1987

ENGINE MECHANICAL DESIGN

SINGLE SIZE BOLT ATTACHES ALL L.R.U.'S



AF3124B-12

COMPETITION SENSITIVE

BENEFITS OF METRICAITON

- Broader Logistical Support Base
- Simplicity in Measurement
- Fewer Resources Required for Procurement, Handling, Stocking, Distributing, Operating and Maintaining of Fewer Systems
- Broader Business Base

CH1615-10

"It's About Time You Guys Joined the Rest of the World"

Mr. H. Takenaka
President of Okura & Co., LTD

After Viewing the T800-APW-800 Mockup -

AF3588-39

DEPARTMENT OF DEFENSE METRICATION PROGRAM

JOHN TASCHER
DEFENSE PRODUCT STANDARDS OFFICE

6-5187

DOD METRICATION PROGRAM

DOD METRICATION PROGRAM (DODD 4120.18) REQUIRES

- JANUARY 1, 1990 AS THE TARGET DATE
- EMPHASIS ON DEVELOPING METRIC SPECS AND STANDARDS TO SUPPORT DEVELOPMENT OF DEFENSE SYSTEMS, EQUIPMENT AND MATERIAL
- SMAs SHALL IDENTIFY DOCUMENTS FOR WHICH A METRIC VERSION IS NEEDED
  - NGS BODIES SHOULD BE ENCOURAGED, OR
  - PREPARING ACTIVITIES SHALL PREPARE DOCUMENTS

8-0496

DOD METRICATION PROGRAM

DEFINITION OF METRIC SPECIFICATION IN MIL-STD-961C

REQUIREMENTS ARE GIVEN IN ROUNDED, RATIONAL, METRIC UNITS, USUALLY AS A RESULT OF BEING ORIGINALLY DEVELOPED IN METRIC. THE MAGNITUDES EXPRESSED ARE MEANINGFUL AND PRACTICAL. . . . METRIC SPECIFICATIONS ARE DEVELOPED FOR ITEMS TO INTERFACE OR OPERATE WITH OTHER METRIC ITEMS.

DOD METRICATION PROGRAM

DEFINITION OF INCH-POUND SPECIFICATION FROM MIL-STD-961C

REQUIREMENTS ARE GIVEN IN ROUNDED, RATIONAL, INCH-POUND UNITS, USUALLY AS A RESULT OF BEING ORIGINALLY DEVELOPED IN INCH-POUND. THE MAGNITUDES ARE MEANINGFUL AND PRACTICAL. ...INCH-POUND SPECS ARE DEVELOPED FOR ITEMS TO INTERFACE OR OPERATE WITH OTHER INCH-POUND ITEMS.

DOD METRICATION PROGRAM

DEFINITION OF "NOT MEASUREMENT SENSITIVE" SPECIFICATION IN MIL-STD-961C

A SPECIFICATION IN WHICH APPLICATION OF THE REQUIREMENTS DOES NOT DEPEND SUBTANTIVELY ON SOME MEASURED QUANTITY. THIS TYPE OF SPECIFICATION CAN BE USED WITH EITHER A METRIC SYSTEM OR AN INCH-POUND SYSTEM.

DOD METRICATION PROGRAM

DEFINITION OF HYBRID SPECIFICATION FROM MIL-STD-961C

SOME REQUIREMENTS ARE GIVEN IN ROUNDED, RATIONAL METRIC UNITS, AND OTHER REQUIREMENTS ARE GIVEN IN ROUNDED, RATIONAL INCH-POUND UNITS. HYBRID SPECS ARE OFTEN REQUIRED FOR USE IN NEW DESIGNS WHERE EXISTING USABLE COMPONENTS MUST INTERFACE IN A METRIC SYSTEM.

DOD METRICATION PROGRAM

GOAL IS NOT METRICATION, PER SE, BUT INTERNATIONAL STANDARDIZATION AND COST EFFECTIVENESS.

DOD METRICATION PROGRAM

INTERNATIONALLY, SOME TECHNOLOGIES AND INDUSTRIES ARE BASED ON INCH-POUND SYSTEM.

EXAMPLES:

- o ELECTRICAL/ELECTRONICS PACKAGING
- o HYDRAULIC TUBING
- o AUTOMOBILE WHEEL RIMS

DOD METRICATION PROGRAM

MANY INCH-POUND DOCUMENTS, IF SOFT CONVERTED, ARE USEFUL IN METRIC ENVIRONMENTS.

- o **MANY TEST METHODS**
- o **COATING THICKNESSES**
- o **PAINTS, LIQUIDS, FUELS**

DOD METRICATION PROGRAM

SYSTEMATIC METRIC STANDARDIZATION ACTIVITIES UNDERWAY:

- **DISC - SAE CONTRACT**
- **DISC METRIC LOG**
- **AEROSPACE SECTOR COMMITTEE METRIC LOG**

DOD METRICATION PROGRAM

SURVEYS - NEED FOR, AND IDENTIFICATION OF, METRIC STANDARDS AND SPECIFICATIONS

- o LEAD SERVICE ACTIVITIES - DEMAND FOR METRIC
- o PREPARING ACTIVITIES - IDENTIFICATION OF METRIC
- o TOP TEN DOD CONTRACTORS - NEED FOR SPECIFIC METRIC DOCUMENTS

DOD METRICATION PROGRAM

MEASUREMENT UNIT IDENTIFICATION OF DODISS DOCUMENTS

12,700 DOCUMENTS IDENTIFIED BY PREPARING ACTIVITIES, TO DATE, OUT OF THE 48,000 DOCUMENTS IN DODISS (26 PERCENT)

750 IDENTIFIED AS "METRIC" (5.9 PERCENT)

542 IDENTIFIED AS "NOT MEASUREMENT SENSITIVE" (4.3 PERCENT)

DOD METRICATION PROGRAM

MANY DOCUMENTS ARE NOW AVAILABLE. EXAMPLES OF FSC/AREAS:

- THDS SCREW THREADS
- 2040 MARINE HARDWARE AND HULL ITEMS
- 53GP HARDWARE AND ABRASIVES
- 5305 SCREWS
- 5306 BOLTS
- 5310 NUTS AND WASHERS
- 5315 NAILS, KEYS AND PINS
- 5320 RIVETS
- 5340 MISCELLANEOUS HARDWARE

DOD METRICATION PROGRAM

SUBSTANTIAL METRIC AVAILABILITY (CONTINUED):

- 6015 FIBER OPTIC CABLES
- 6030 FIBER OPTIC DEVICES
- 6060 FIBER OPTIC INTERCONNECTORS
- 6140 BATTERIES, RECHARGEABLE
- 6810 CHEMICALS
- 6850 MISCELLANEOUS CHEMICAL SPECIALTIES
- 6910 TRAINING AIDS
- 9140 FUEL OILS
- 9150 OILS & GREASES

DOD METRICATION PROGRAM

SUBSTANTIAL METRIC AVAILABILITY (CONTINUED):

- o 95GP METAL BARS, SHEETS, AND SHAPES
- o 9505 WIRE, NONELECTRICAL, IRON AND STEEL
- o 9515 PLATE, SHEET, STRIP & FOIL; IRON AND STEEL
- o 9520 STRUCTURAL SHAPES, IRON AND STEEL
- o 9525 WIRE, NONELECTRICAL, NONFERROUS BASE METAL
- o 9530 BARS AND RODS, NONFERROUS BASE METALS

DOD METRICATION PROGRAM

MANY DOCUMENTS ARE "NOT MEASUREMENT SENSITIVE" IN THESE FSC/AREAS:

o ATTS	AUTOMATIC TEST TECHNOLOGY
o CMAN	CONFIGURATION MANAGEMENT
o DRPR	DRAWING PRACTICES
o IPSC	INFORMATION PROCESSING STANDARDS FOR COMPUTERS
o MISC	MISCELLANEOUS
o MINTY	MAINTAINABILITY
o QCIC	QUALITY CONTROL/ASSURANCE & INSPECTION
o RELI	RELIABILITY
o TMSS	TECHNICAL MANUALS SPECS AND STDS

DOD METRICATION PROGRAM

MANY DOCUMENTS "NOT MEASUREMENT SENSITIVE" (CONTINUED):

- o 1370 PYROTECHNICS
- o 1375 DEMOLITION MATERIALS
- o 1810 SPACE VEHICLES
- o 1820 SPACE VEHICLE COMPONENTS
- o 1990 MISCELLANEOUS VESSELS
- o 4320 POWER AND HAND PUMPS

DOD METRICATION PROGRAM

MANY DOCUMENTS "NOT MEASUREMENT SENSITIVE" (CONTINUED):

- o 4520 SPACE HEATING EQUIPMENT & DOMESTIC WATER HEATERS
- o 4530 FUEL BURNING EQUIPMENT UNITS
- o 4940 MISC MAINT & REPAIR SHOP SPECIALIZED EQPT
- o 6810 CHEMICALS
- o 8010 PAINTS, DOPES, VARNISHES & RELATED PRODUCTS
- o 8030 PRESERVATIVE AND SEALING COMPOUNDS
- o 8040 ADHESIVES

DOD METRICATION PROGRAM

METRIC VERSIONS NEEDED FOR MANY GENERAL DESIGN AND GENERAL EQUIPMENT STANDARDS AND SPECIFICATIONS. EXAMPLES ARE:

- o MIL-STD-454, STANDARD GENERAL REQUIREMENTS FOR ELECTRONIC EQUIPMENT
- o MIL-E-4158, GENERAL REQUIREMENTS FOR ELECTRONIC EQUIPMENT - GENERAL
- o MIL-E-5400, GENERAL SPECIFICATION FOR ELECTRONIC EQUIPMENT - AIRBORNE
- o MIL-M-8090, GENERAL SPECIFICATION FOR MOBILITY; GROUND SUPPORT EQUIPMENT
- o MIL-STD-1515, FASTENER SYSTEM FOR AEROSPACE APPLICATIONS

- MIL-HDBK-5, METALLIC MATERIALS AND ELEMENTS FOR AEROSPACE VEHICLE STRUCTURES
- MIL-W-5088, AEROSPACE VEHICLE WIRING

(FROM AEROSPACE SECTOR COMMITTEE SLED LOG AND RESPONSES TO DOD SURVEY OF 10 MAJOR CONTRACTORS)

DOD METRICATION PROGRAM

METRIC SPECIFICATIONS NEEDED FOR MANY COMMODITIES. EXAMPLES ARE:

o METAL SHEETS	o WIRE
o BAR STOCK	o PULLEYS
o BOLTS	o NUTS
o HOSE ASSEMBLIES	o BUSHINGS
o BLIND RIVETS	o SCREWS
o WASHERS	o SHAPES

(FROM AEROSPACE SECTOR COMMITTEE PMP LOG AND RESPONSES TO DOD SURVEY OF TEN CONTRACTORS)

DOD METRICATION PROGRAM

MANY CASES WHERE METRIC DOCUMENTS ARE AVAILABLE, BUT ITEMS ARE NOT BEING PRODUCED.

- o AEROSPACE FASTENERS
- o PLATE, SHEET, STRIP, AND FOIL
- o STRUCTURAL SHAPES
- o RINGS, SHIMS, AND SPACERS

SUMMARY

THE NATION'S DECISION HAS BEEN MADE.

THE TIME FOR BICKERING IS OVER.

DOD CANNOT DO IT ALL BUT IS THE CATALYST.

BUREAUCRATIC METHODS AND JOINT SOLUTIONS (COMPROMISES) WILL IMPEDE THE TRANSITION.

METRICATION IS A MANGEMENT PROBLEM, NOT A TECHNICAL ONE.

1988 DOD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

PANEL 2 SESSION A

NDI-IS THE DOD REALLY SERIOUS?

Panelists will discuss history of DoD's efforts to buy and use more commercial and Nondevelopmental Items (NDI's), some recent developments including proposed legislation, work by the Defense Science Board, and DoD policies for use of NDI's. Opportunities and impediments to greater successes in acquiring NDI's will also be discussed. The panel will include a case study of how some of the traditional roadblocks to using commercial hardware were overcome.

CHAIR: **Mr. Gregory E. Saunders, Assistant for Commercial Acquisition, OASD(P&L)SDM**

PANELISTS: **Mr. Henry A. Filippi, Chief, Engineering Programs Div, Directorate of Technical & Logistics Services, DLA-SE**
Col John R. Power, Project Manager, Mobile Subscriber Equipment, AMC
Mr. William A. Shook, Attorney, Preston, Thorgrimson, Ellis, and Holmon
Mr. Alfred Volkman, Director, Contract Policy & Admin, OASD(P&L)P
Mr. Jonathan L. Etherton, Senate Armed Services Committee

Panel 2 - Session A

NDI - Is the DoD Really Serious

This panel was a roundtable discussion of issues affecting NDI procurement. The NDI legislation as well as the Mattingly amendment prohibiting commercial market acceptability as a requirement were briefly discussed. John Etherton felt the report submitted to Congress was a disappointment and that Congress may prescribe measures to make DoD more responsive to the intent of the NDI legislation. Some confusion surrounded the definition of NDI. Several in the audience did not realize NDI encompass more than just commercial products.

The panel discussed a number of observations relating to NDI procurement. NDI acquisition is favored by European supplies because systems developed by America's allies are included in the definition of NDI. One example was the Harrier aircraft. Another is the Mobile Subscriber Equipment (MSE) being purchased by the Army. This is a $4.5 billion procurement, the second largest Army procurement of fiscal year 1988. MSE did not require R&D funding because the system is based on a European design. When fully implemented it will provide telephone communications to every combat division.

It was also noted that DoD already buys a substantial amount of commercial products. Fifty percent of DLA procurement is by commercial part number. DoD has adopted 4200 non-Government standards and uses another 3,000 which have not been adopted. In fast moving high technology areas, using commercial products is the only way to keep up with the state of the art.

The panel raised a number of issues including:

1. Follow-on logistics support.
2. Technical Data Package.
3. A way to measure NDI procurements.
4. A lack of coordination between people who establish requirements and the suppliers who must meet them.
5. Support for discontinued items.
6. Cost or pricing data on new products.

A number of potential solutions were offered to address the problem of logistics support for NDI.

1. Initially provision spare parts.
2. Establish a bonded bin of spare parts at the contractor's facility.
3. Place an option to buy spares in the procurement contract.
4. Make logistics support part of the contract.
5. Negotiate a requirements contact with the supplier.
6. Place proprietary data in escrow.
7. Negotiate a royalty free license for spare parts procurement.

Solving the other issues raised is somewhat more difficult. Measuring NDI procurement will be difficult and labor intensive. Moreover NDI should only be used when it is prudent to do so casting doubt on how useful such a measurement would be.

The requirement for cost or pricing data also has no easy solution; however, it was emphasized th[illegible] the data is not required so long as a procurement is competitive.

The panel felt the NDI program needs to be emphasized and brought to the "working level." The definition of NDI also needs to be more widely promulgated. Among actions recommended to promote the program are:

1. A provision allowing commercial market acceptability to be a requirement in technical documents.

2. Focus on implementation instead of new policy.

3. Emphasize best value instead of best price.

4. Share success stories.

5. Eliminate confusing contract clauses.

1988 DOD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

PANEL 2 SESSION B

Total Quality Management (TQM) is a concept that demands top management leadership and continuous improvement in processes. The successful TQM operation is characterized by an organization of quality trained and motivated employees working in an environment where managers encourage creativity, initiative, trust, and where each individual's contributions are actively sought to upgrade quality. This panel will address all key characteristics of a successful TQM operation.

CHAIR: Mr. Jack C. Strickland, Director, Industrial Productivity and Quality, OASD(P&L)IPQ

PANELISTS: Mr. Ernest Ellis, Deputy Executive Director for QA, DLA
Mr. Michael LaVersa, Assistant to the Director for R,M&Q, OASN(S&L)
Mr. Seymour J. Lorber, Dep. Chief of Staff for Product Assurance & Testing, AMC
Col John C. Reynolds, Asst. to the Commander for Quality Programs, HQ AFLC
Mr. George Thielen, Chief, Product Assurance Engineer, ENSI, ASD
Mr. Arthur L. Welch, Corp VP for Product Assurance, Martin-Marietta Corp., Bethesda, MD

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PANEL 2, SESSION B   TOTAL QUALITY MANAGEMENT

Mr. Jack Strickland, Director, Industrial Productivity and Quality, OASD (P&L), chaired the panel session and presented an overview and status report of the TQM initiative. He emphasized that TQM is the environment created by top management which motivates the people in the organization to continously improve the processes used to perform their functions. The briefing and copies of pertinent TQM reference material, showing the extent of support and commitment by top DoD management and the military services, is included with these proceedings.

Mr. Seymour J.Lorber, Deputy Chief of Staff for Product Assurance and Testing, Army Materiel Command, described the TQM implementation by the AMC as consisting of two major, closely related components. One component involves all AMC personnel, functions and processes. The second component is the implementation of TQM in Army acquisition activities. Mr. Lorber's presentation included examples of benefits resulting from TQM on two major weapon system programs.

Mr. Ernest Ellis, Deputy Executive Director for Qulity Assurance, Defense Logistics Agency, presented the status to implement the TQM process in that Agency's acquisitions, operation of supply centers, and contract administration activities.

COL. John C. Reynolds, Assistant to the Commander for Quality Programs, HQ AFLC, described AFLC's success with TQM by management's commitment and their emphasis on people and processes. The briefing, included in these proceedings, contains a summary of accomplishments, significant cost savings and quality improvements.

Mr. George J.Thielen, Chief, Product Assurance Engineering, ENSI, ASD, AFSC, chaired the DoD Steering Group, formed in response to the OSD policy direction to eliminate fixed Acceptable Quality Levels (AQL) requirements from Military Specifications. His presentation was a summary of the group's activities, conclusions and recommendations. The complete final report of the steering group is included in these proceedings.

Mr. Arthur L. Welch, Corporate VP for Product Assurance, reviewed the TQM process as implemented at the Martin - Marietta Corp. His presentation, included in these proceedings, described several of the processes involved and emphasized the dramatic quality improvements and cost savings achieved.

Kurt Greene   IPSO 8/26/88   756-2551

PANEL 2, SESSION B   TOTAL QUALITY MANAGEMENT

LIST OF ATTACHMENTS FOR PROCEEDINS

- o TOTAL QUALITY MANAGEMENT INSTITUTIONALIZATION
  MR. JACK STRICKLAND
- o DEPARTMENT OF DEFENSE POSTURE STATEMENT ON QUALITY, 30 MAY, 1988
- o DOD IMOLEMENTS TOTAL QUALITY MANAGEMENT
  NEWS RELEASE, 18 AUGUST, 1988
- o IMPLEMENTATION OF TOTAL QUALITY MANAGEMENT IN DOD ACQUISITIONS
  DR. ROBERT B. COSTELLO, 19 AUGUST, 1988
- o AFLC MEANS QUALITY
  COL. JOHN C. REYNOLDS
- o WORKING GROUP ON ELIMINATION OF FIXED DEFECT LEVELS FROM MILITARY SPECIFICATIONS, FINAL REPORT, 13 JULY, 1988
  MR. GEORGE J. THIELEN
- o TOTAL QUALITY MANAGEMENT MARTIN-MARIETTA CORP.
  MR. ARTHUR L. WELCH

TOTAL QUALITY MANAGEMENT INSTITUTIONALIZATION

MR. JACK C. STRICKLAND
DIRECTOR, INDUSTRIAL PRODUCTIVITY
AND QUALITY
OASD(P&L)
AUGUST 18, 1988

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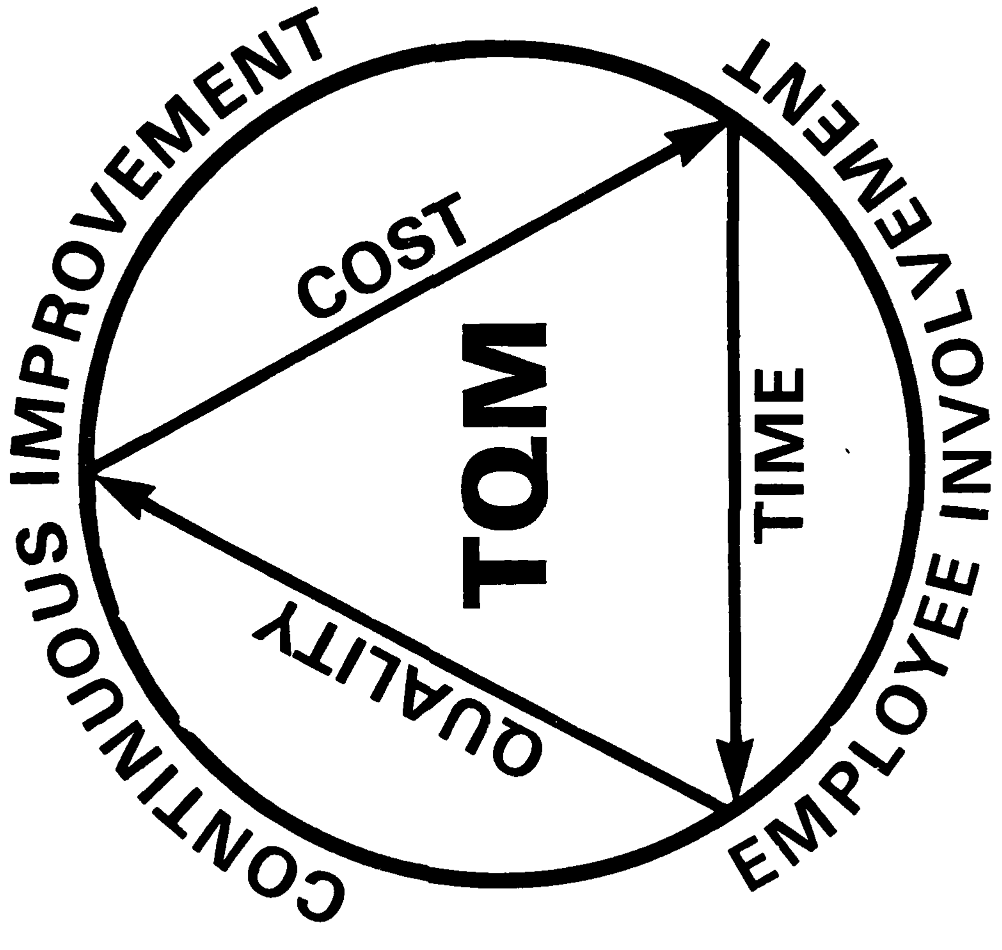
8-5274


TQM
COST
TIME
QUALITY
CONTINUOUS IMPROVEMENT
EMPLOYEE INVOLVEMENT

TOTAL QUALITY MANAGEMENT ELEMENTS

GUIDING PRINCIPLES

- MANAGEMENT COMMITMENT
- USER SATISFACTION
- CONTINUOUS IMPROVEMENT
- EMPLOYEE INVOLVEMENT
- SUPPLIER PARTICIPATION
- REWARD/RECOGNITION

OVERALL CONCEPTS	MANUFACTURING TECHNIQUES	PRODUCT DESIGN APPROACHES
ACQUISITION STREAMLINING	JUST-IN-TIME (JIT)	CONCURRENT ENGINEERING
VARIABILITY REDUCTION	AUTOMATION/ROBOTS	DESIGN SIMPLIFICATION
QUAL. FUNCTION DEPLOYMENT	PROCESS CONTROL	COMPUTER-AIDED ENGINEERING (CAE)
R&M 2000	COMPUTER-INTEGRATED MANUFACTURING	ROBUST DESIGN
QUANT.		
PROBLEM SOLVING TOOLS		
VALUE ENGINEERING		
TRANSITION TO PRODUCTION		

8-6274

WHERE ARE WE?

- PROCESS INITIATED
- LAID FOUNDATION FOR IMPLEMENTATION
- INFRASTRUCTURE IDENTIFIED FOR POLICY DEPLOYMENT

8 5274

BUILDING BLOCKS SET IN PLACE

- SECDEF POSTURE STATEMENT ISSUED
- DoD MASTER PLAN DEVELOPED
- DoD WIDE TRAINING PLAN UNDER DEVELOPMENT
- MANAGEMENT AWARENESS TRAINING
- EXPERTISE AND TOOLS FOR TQM BEING EXPANDED
- KEY BARRIERS TO TQM IDENTIFIED

8 5274

NEXT STEPS

ESTABLISH TQM EXECUTIVE STEERING COMMITTEES

- FOR DoD — DEFENSE COUNCIL ON INTEGRITY AND MANAGEMENT IMPROVEMENT (DCIMI)
- FOR ACQUISITION — DEFENSE ACQUISITION BOARD (DAB)

FUNCTIONS

- SET OBJECTIVES
- REVIEW PLANS
- OVERSEE IMPLEMENTATION
- ADDRESS TQM BARRIERS

8-5274

NEXT STEPS (CONTINUED)

- SERVICES, DEFENSE AGENCIES, AND OSD OFFICES DEVELOP DETAILED IMPLEMENTATION PLANS FOR:
  - INTEGRATED TEAM STRUCTURES
  - INTERNAL PROCESS IMPROVEMENT
  - TRAINING AND FACILITATION STRATEGIES AND MATERIALS
  - TQM-ORIENTED CONTRACTING STRATEGIES AND METHODS
  - CROSS-FUNCTIONAL DoD/INDUSTRY ACTIVITIES
  - TQM-REINFORCING REWARD AND RECOGNITION SYSTEMS
  - CONSISTENT, UNIFIED POLICIES AND REGULATIONS

8-5274

TQM IS A ROAD TO IMPROVEMENT

- TQM HAS A SIGNIFICANT, ONGOING PAYOFF
- IT TAKES TIME AND EFFORT
- TOP MANAGEMENT MUST MAKE AND KEEP A COMMITMENT TO TQM, AND LEAD THE WAY
- THROUGHOUT AMERICA, THE TQM CONCEPT IS RAPIDLY BUILDING MOMENTUM
- TQM APPLIES TO EVERYTHING AND EVERYONE . . . INCLUDING DoD

8 5274

THE SECRETARY OF DEFENSE

WASHINGTON, THE DISTRICT OF COLUMBIA

30 MAR 1988

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
DIRECTOR, DEFENSE RESEARCH AND ENGINEERING
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL
INSPECTOR GENERAL
DIRECTOR, OPERATIONAL TEST & EVALUATION
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTORS OF THE DEFENSE AGENCIES

SUBJECT: Department of Defense Posture on Quality

It is critical at this time that the Department of Defense (DoD), its contractors, and their vendors focus on quality as the vehicle for achieving higher levels of performance. The DoD budget leaves no room for solving problems that flow from poor quality. Quality is synonymous with excellence. It cannot be achieved by slogans and exhortation alone, but by planning for the right things and setting in place a continuous quality improvement process.

Total Quality Management (TQM) is a concept that demands top management leadership and continuous involvement in the process activities. The successful TQM operation is characterized by an organization of quality trained and motivated employees, working in an environment where managers encourage creativity, initiative, and trust, and where each individual's contributions are actively sought to upgrade quality. Secretary Weinberger's memorandum of February 2, 1987, asked you to create teams of line managers at all levels to remove organizational and procedural impediments to productivity and quality. These productivity and quality teams should play an important role in the DoD TQM process.

I am giving top priority to the DoD Total Quality Management (TQM) effort as the vehicle for attaining continuous quality improvement in our operations, and as a major strategy to meet the President's productivity objectives under Executive Order 12552. The attached DoD Posture Statement on Quality reflects the fundamental principles that underpin this initiative. TQM has already achieved reduced costs and increased efficiency and effectiveness in several DoD components. We now need to expand the TQM effort throughout DoD. The ultimate goal is the satisfied, quality-equipped, quality-supported soldier, sailor, airman, and Marine.

30452

Quality in weapons systems is central to the DoD mission. Therefore, I have asked the Under Secretary of Defense for Acquisition to lead the TQM thrust by implementing it as an integral element of the entire acquisition process. In doing so he will be seeking a fundamental change in how the acquisition community views product quality. He will develop the policies and seek the appropriate Federal Acquisition Regulation and other regulatory changes to ensure that TQM is enforced in requirements formulation, design, development, production planning, solicitation and source selection, manufacturing, fielding, and support. You should ensure that all program managers are trained to apply TQM measures in acquisition planning and throughout all aspects of program execution.

As we move forward with implementation of the TQM process DoD wide, we will strengthen ourselves internally to make us better partners in our relationships with industry, the Congress, and the public. I am convinced that as the quality-first concept inherent in TQM is shown to benefit the defense sector, it will seed a renaissance of quality throughout the United States.

I ask for your personal involvement in this endeavor. Please ensure that this letter and the DoD Posture Statement on Quality are widely circulated throughout your organization.

Attachment

THE SECRETARY OF DEFENSE

WASHINGTON, THE DISTRICT OF COLUMBIA

DoD POSTURE ON QUALITY

- *Quality is absolutely vital to our defense, and requires a commitment to continuous improvement by all DoD personnel.*
- *A quality and productivity oriented Defense Industry with its underlying industrial base is the key to our ability to maintain a superior level of readiness.*
- *Sustained DoD wide emphasis and concern with respect to high quality and productivity must be an integral part of our daily activities.*
- *Quality improvement is a key to productivity improvement and must be pursued with the necessary resources to produce tangible benefits.*
- *Technology, being one of our greatest assets, must be widely used to improve continuously the quality of Defense systems, equipments and services.*
- *Emphasis must change from relying on inspection, to designing and building quality into the process and product.*
- *Quality must be a key element of competition.*
- *Acquisition strategies must include requirements for continuous improvement of quality and reduced ownership costs.*
- *Managers and personnel at all levels must take responsibility for the quality of their efforts.*
- *Competent, dedicated employees make the greatest contributions to quality and productivity. They must be recognized and rewarded accordingly.*
- *Quality concepts must be ingrained throughout every organization with the proper training at each level, starting with top management.*
- *Principles of quality improvement must involve all personnel and products, including the generation of products in paper and data form.*

NEWS RELEASE

OFFICE OF ASSISTANT SECRETARY OF DEFENSE
(PUBLIC AFFAIRS)
WASHINGTON, D.C. - 20301
PLEASE NOTE DATE

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IMMEDIATE RELEASE   August 18, 1988

DOD IMPLEMENTS TOTAL QUALITY MANAGEMENT

Secretary of Defense Frank C. Carlucci annnounced today that the Department of Defense (DoD) would formally implement Total Quality Management throughout all DoD activities.

Total Quality Management is dedicated to controlling quality during the process of production, instead of inspecting quality after the fact. Developed from the teachings of W. Edward Deming, the system can be applied to the full range of defense activities, from troops in the field performing missions to the complex administration of the Services.

Secretary Carlucci intends to use the Total Quality Management approach to achieve the highest possible quality at the lowest possible cost, so that DoD can procure the maximum number of weapons systems within today's constrained budgets. He recognizes that Total Quality Management will require a total cultural change in the Department's traditional approach in doing business. The Secretary of Defense and his senior leadership view the institutionalization of Total Quality Management as a top priority for DoD.

As part of the Department's implementation of Total Quality Management, 45 of the top leaders from the Office of the Secretary of Defense, the military Services, the Joint Chiefs of Staff, and Defense agencies met today to discuss the Total Quality Management concept and the Department's implementation plans. They were briefed by William W. Scherkenbach, who has studied under Deming, and who now works with major U.S. companies to help them implement Deming's philosophies.

Other Total Quality Management principles include:

- Involvement of everyone in an organization, especially top management.

- Workers are not blamed for poor quality. Quality becomes the responsiblity of management.

- Quality is "designed in" and is achieved by controlling the production process, thus reducing waste and decreasing costs and time requirements.

- Total Quality Management can be applied to workers generating data and other administrative products and services.

-END-

THE UNDER SECRETARY OF DEFENSE

WASHINGTON, DC 20301

ACQUISITION

(P&L/PS)

1 9 AUG 1988

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
ASSISTANT SECRETARY OF DEFENSE (PRODUCTION AND LOGISTICS)
DIRECTORS OF DEFENSE AGENCIES

SUBJECT: Implementation of Total Quality Management in DoD Acquisition

The Department of Defense is facing one of the most challenging periods in its history. We must maintain the important gains in readiness already made and at the same time continue steady improvement in the face of greater austerity, increasing technological complexity, and a growing diversity of threats. We believe that Total Quality Management (TQM) can provide the leverage to meet these unparalleled challenges. I am convinced that by implementing TQM, and by coupling it with the intensified application of such value-added strategies as Acquisition Streamlining, Transition from Development to Production, Could Cost, and others, we can achieve unprecedented improvements in the effectiveness of the DoD acquisition process.

I want TQM applied to the acquisition of defense systems, equipment, supplies, facilities, and services to ensure continuous improvement of products and services being provided to, and by, the Department of Defense. The principles outlined in the March 30, 1988, DoD Posture on Quality will guide TQM implementation efforts. A suggested definition of TQM is shown in attachment 1.

I am making TQM success my primary objective. We will link TQM to the weapon system decision process to ensure that it is properly considered in acquisition strategy development and effectively implemented during contract execution. To this end, I am requesting that the Defense Acquisition Board (DAB) act as the DoD steering group for TQM implementation in acquisition. The initial DAB meeting on TQM implementation will follow the senior level awareness training session scheduled for August 18, 1988. A specific agenda will be forwarded under separate cover.

One of the earliest agenda items will be to approve and issue a DoD implementation strategy for acquisition and identify acquisition improvement objectives. The TQM strategy will serve as a basis for formulation of individual Service and Agency

implementation plans. Mr. Jack Strickland, Director for Industrial Productivity and Quality, staff lead for TQM, is developing a "strawman" of the TQM strategy. Copies will be circulated for your review in advance of the initial meeting.

The key to TQM implementation lies in leadership by DoD program managers and by their contractors and suppliers at all tiers. In this regard, management in both government and industry must create the climate which will foster TQM implementation and ensure that their personnel are properly trained and motivated. To initiate this process, I ask that you take the following actions:

1. Develop your plan for TQM implementation. Attachment 2 contains a listing of some preparatory activities that may be taken to start TQM implementation. Your plan should include: (a) how you will incorporate TQM into the acquisition strategies and plans for all major system new starts; (b) how you will apply TQM to existing programs and identify pilot programs; (c) how TQM will flow down to subcontractors and suppliers relating to your programs; and (d) how you plan to apply TQM to those programmatic and other efforts related to the activities of knowledge workers, including management, technical, and other speciality personnel. I would like to review your implementation plan by October 31, 1988.

2. Nominate a SES/Flag level TQM focal point for coordination of TQM at the working level. Your nominee should have a broad perspective of acquisition.

I am looking forward to working with you to help achieve the extraordinary promise of TQM.

Attachments

Attachment 1

DoD Total Quality Management (TQM)

TQM is a management process directed at establishing organized continuous process improvement activities, involving everyone in an organization - both white and blue collar personnel - in a totally integrated effort toward improving performance at every level. This improved performance is directed toward satisfying such cross-functional goals as quality, cost, schedule, mission need, and suitability. TQM integrates fundamental management techniques, existing improvement efforts, and technical tools into a disciplined approach focused on continuous process improvement. These activities are ultimately focused on increased user/customer satisfaction.

Attachment 2

Preparatory Activities for Total Quality Management(TQM) Implementation

To begin the process of TQM implementation, initial steps should be taken to:

- become acutely aware of the principles, practices, techniques and tools associated with TQM (the attached reading list will be useful).

- obtain TQM-related training for key personnel and their subordinates.

- begin a dialogue with development/production contractors and potential offerors to encourage self-initiation of TQM effort.

- examine the programs and processes for which the activity is responsible and identify ways in which to improve them using the TQM principles.

- establish process improvement teams within Government and contractor organizations to pursue improvements aimed at increasing customer satisfaction, improving performance, reducing cycle time, and reducing cost.

- ensure your TQM implementation efforts include improving the processes involving knowledge workers, including management, technical, and other speciality personnel.

- begin TQM organizational planning.

- identify to Program Executive Officers, or Service Acquisition Executives, those contractors who are qualified and receptive to the intensive application of TQM principles.

Attachment 2 (Continued)

Suggested Readings

The key to effective and successful implementation of TQM is understanding of the underlying philosophy and theories that support continuous process improvement efforts. DoD and industry personnel need not wait for formal training or indoctrination. The following suggested books are some of the best in the field of continuous process improvement. They will provide a sound basis for understanding DoD's TQM philosophy and vision.

Crosby, Philip B.: Quality is Free, McGraw-Hill Book Company, New York, 1979.

Deming, W. Edwards: Out of the Crisis, Massachusettes Institute of Technology, Center for Advanced Engineering StudY, Cambridge, Mass., 1986.

Feigenbaum, Amand V.: Total Quality Control, McGraw-Hill Book Company, New York, 1983.

Harrington, H James: The Improvement Process, McGraw-Hill Book Company, New York, 1987.

Imai, Masaaki: Kaizen, Random House, New York, 1986.

Ishikawa, Kaoru: What is Total Quality Control?, Prentice-Hall, Engilewood Cliffs, N.J., 1985.

Juran, J. M.: Managerial Breakthrough, McGraw-Hill Book Company, New York, 1964.

Scherkenbach, William: The Deming Route to Quality and Productivity, Cee Press, Washington, D.C.,1986.

Schonberger, Richard J.: Japanese Manufacturing Techniques: Nine Hidden Lessions in Simplicity, The Free Press, New York, 1982.

Townsend, Patrick L.: Commit to Quality, John Weiley and Sons, New York, 1986.

88-1533-1

AF LOGISTICS COMMAND

AFLC means QUALITY

PRESENTER COL JOHN C. REYNOLDS
ASSISTANT TO THE COMMANDER
FOR QUALITY PROGRAMS

COMMANDER'S QUALITY DEFINITION

"QUALITY IS DISCIPLINE; DISCIPLINE THAT DELIVERS PRODUCTS OR SERVICES THAT EQUAL OR EXCEED CUSTOMER EXPECTATIONS; IT APPLIES TO INDUSTRIAL AND MANAGEMENT PROCESSES AND EMBRACES R&M. QUALITY IS CONSISTENCY IN LOGISTICS PROCESS UNDERSTANDING, MEASUREMENT AND EXECUTION."

ALFRED G. HANSEN
GENERAL, USAF
COMMANDER

(REV 13 JAN 88)

BATTLE CRY OF THE COMMAND

QUALITY =

- **PEOPLE**

  \+

- $\boxed{\textbf{PROCESS}}$

  \+

- **PRODUCT**

  \+

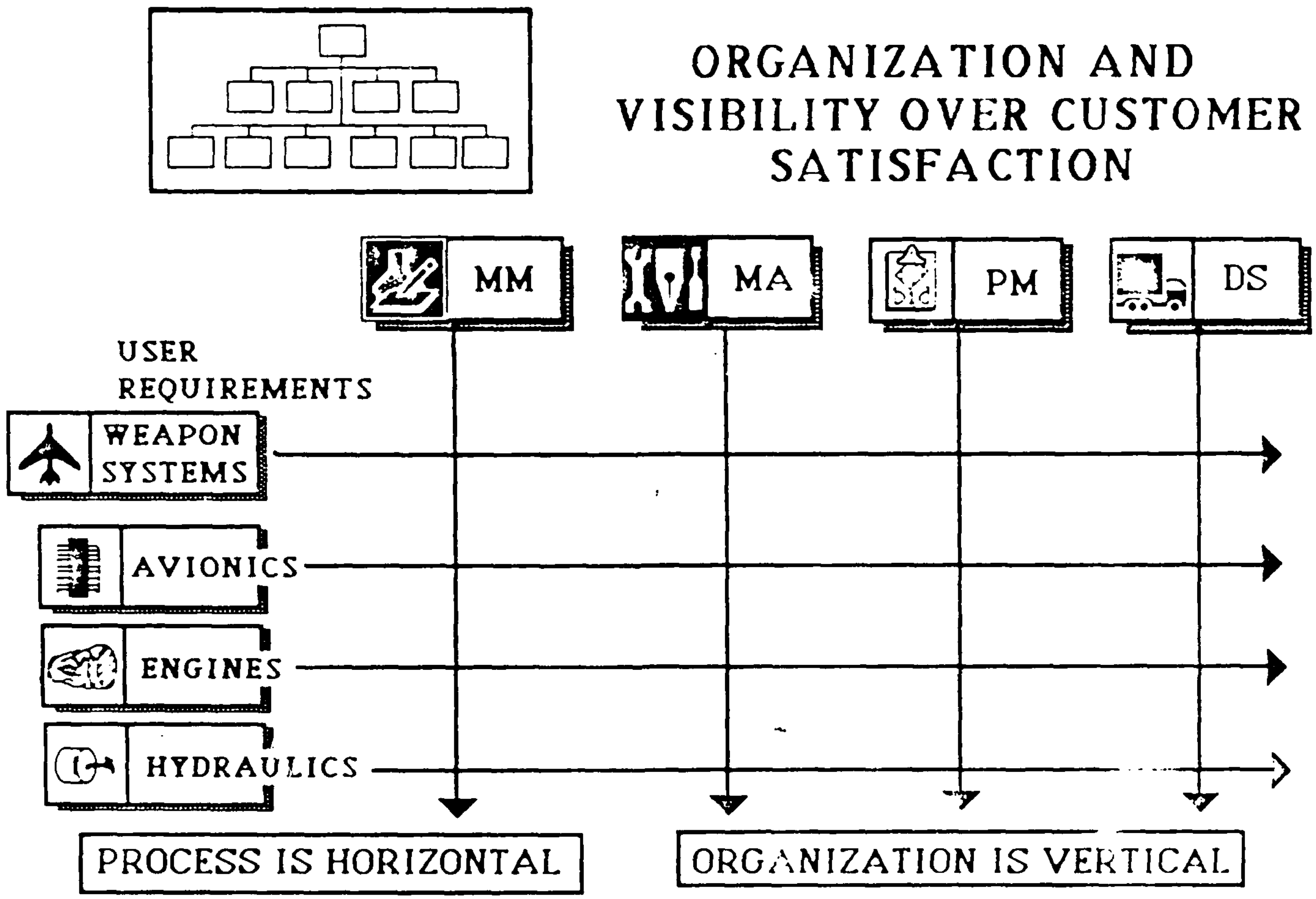
- **PERFORMANCE**

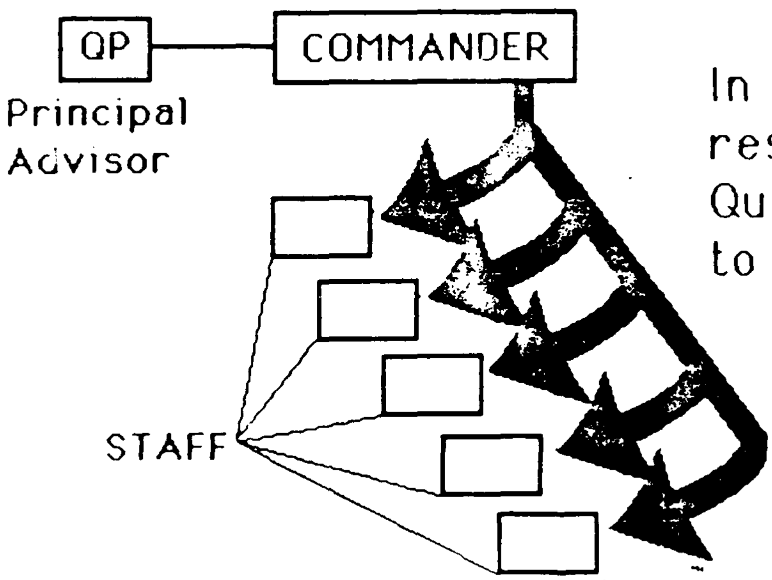
QP^4 = COMBAT STRENGTH THROUGH LOGISTICS

AFLC QUALITY MODEL

FORCE MULTIPLIER — HEDGE AGAINST THE FUTURE

88-4886-9


ORGANIZATION AND
VISIBILITY OVER CUSTOMER
SATISFACTION
MM
MA
PM
DS
USER
REQUIREMENTS
WEAPON
SYSTEMS
AVIONICS
ENGINES
HYDRAULICS
PROCESS IS HORIZONTAL
ORGANIZATION IS VERTICAL



In AFLC, the responsibility for Quality cascades to every level

PROCESS ACTION TEAM (PAT) CONCEPT

- **CONCEPT**
  - MANAGEMENT DEFINES KEY PROCESSESS
  - PROCESSESS APPROVED
  - PROCESSESS DISSECTED - WEAKNESS IDENTIFIED - PRIORITIZED
  - PROCESS ACTION TEAMS FORMED
    - OBJECTIVES ESTABLISHED
    - CROSS FUNCTIONAL - ALL INVOLVED
    - OWNER/LEADER APPOINTED
    - TAKE THE PROCESS APART
    - MAKE RECOMMENDATIONS
    - DISESTABLISH TEAM WHEN OBJECTIVE ACHIEVED/CONTROLS IN PLACE
  - MANAGEMENT OBLIGED TO IMPLEMENT RECOMMENDATIONS
  - COMPLIMENTS QUALITY CIRCLES

TOOLS

- SPC (MA - MM CORE COURSE)
- VARIATION REDUCTION (DELCO MORAINE) (ITT) (FORD BATAVIA)
- LEAD TIME REDUCTION MODEL (GM INLAND)
- MEMORY JOGGER
- TAGUCHI DESIGN OF EXPERIMENTS (AFIT PHD HELPING)
- QUALITY CASCADING (GM INLAND)
- TRANSACTION VOLUME ANALYSIS (IBM)
- PAT MODEL SUCCESS - BID RESPONSE IMPROVEMENT (BOEING)
- QUALITY FUNCTION DEPLOYMENT (ROCKWELL AUTOMOTIVE)

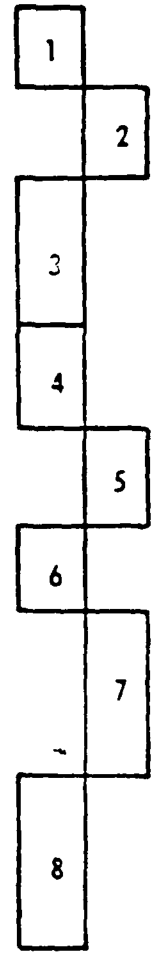
THE LEAD TIME REDUCTION GRAPHIC TOOL

THE LEAD TIME REDUCTION PROCESS

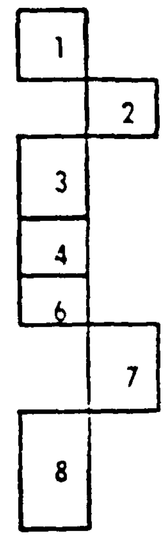
1. IDENTIFY THE PRODUCT/SERVICE YOU PROVIDE.
2. LIST ALL STEPS REQUIRED TO COMPLETE PRODUCT, FROM START TO FINISH.
3. IDENTIFY TIME NOW REQUIRED TO COMPLETE EACH STEP.
4. IDENTIFY STEPS THAT ADD VALUE TO THE PRODUCT.
5. GRAPH PROCESS (SEE FLIP SIDE OF CARD FOR GRAPHIC TOOL).
6. ANALYZE & ELIMINATE TIME NEEDED FOR NON-VALUE-ADDED ("NVA") STEPS.
7. ANALYZE & REDUCE TIME NEEDED FOR VALUE-ADDED ("VA") STEPS
8. GRAPH THIS PROCESS
9. IDENTIFY THE "IDEAL" PROCESS (IDEAL = MINIMUM TIME FOR "VA" STEPS WITH NO "NVA" STEPS).
10. GRAPH IDEAL PROCESS & WORK TO ACHIEVE IT.

DIRECTIONS FOR USE

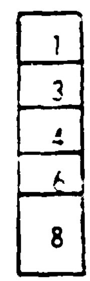
- MAKE ONE BOX FOR EACH STEP.
- MAKE BOX HEIGHT ROUGHLY PROPORTIONAL TO TIME REQUIRED FOR STEP.
- PUT "VA" BOXES ON LEFT.
- PUT "NVA" BOXES ON RIGHT.
- PUT BOXES IN CORRECT ORDER.
- LABEL BOXES (NAME OF STEP & TIME REQUIRED).



ORIGINAL



CURRENT



IDEAL

THE GOAL POST MENTALITY

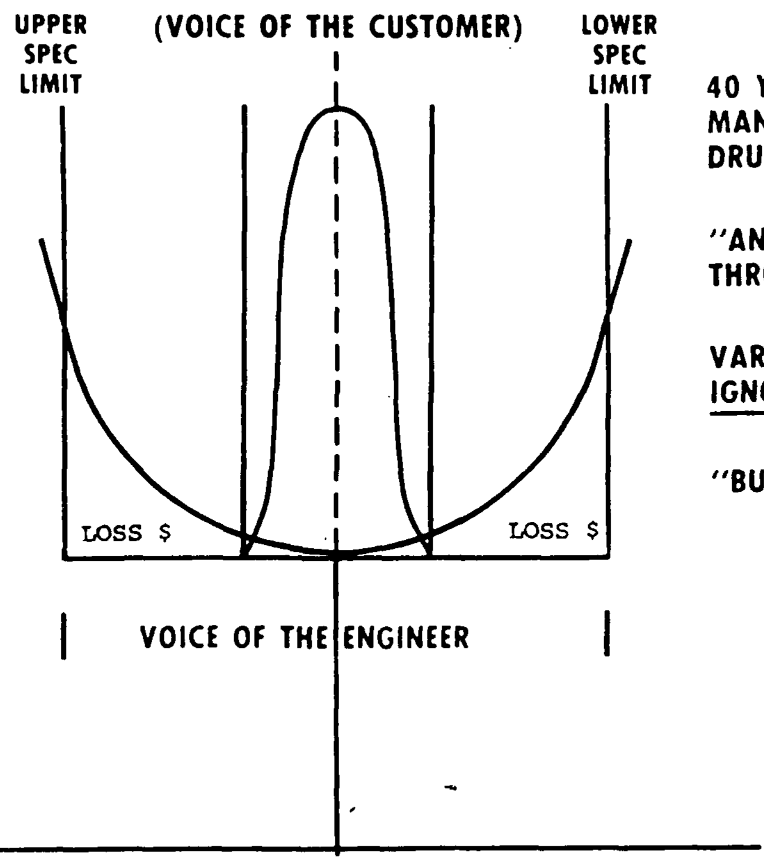
"VARIATION IS THE ENEMY OF QUALITY!"

"HOW THE JAPANESE HAVE TAKEN OUR OWN DESIGNS & KILLED US IN THE WORLD MARKET PLACE."

"THEY BUILD BETTER & CHEAPER <u>WITHOUT</u> CHANGING THE DESIGN."

"HOW CAN THIS BE?"

"THEY REDUCE VARIATION, REDUCE COSTS, ELIMINATE SCRAP & REWORK AND REDUCE LOSS TO THE CUSTOMER."



40 YEARS OF ENGINEERING MANUFACTURING ACADEMIC DRUM BEAT

"ANY BALL PASSING THROUGH = 3 POINTS"

VARIATION WITHIN POSTS <u>IGNORED!</u>

"BUILD TO PRINT & QUIT!"

THAT'S WHY YOU WATCH, TELL TIME, LISTEN TO AND PROBABLY DRIVE A FOREIGN MADE PRODUCT

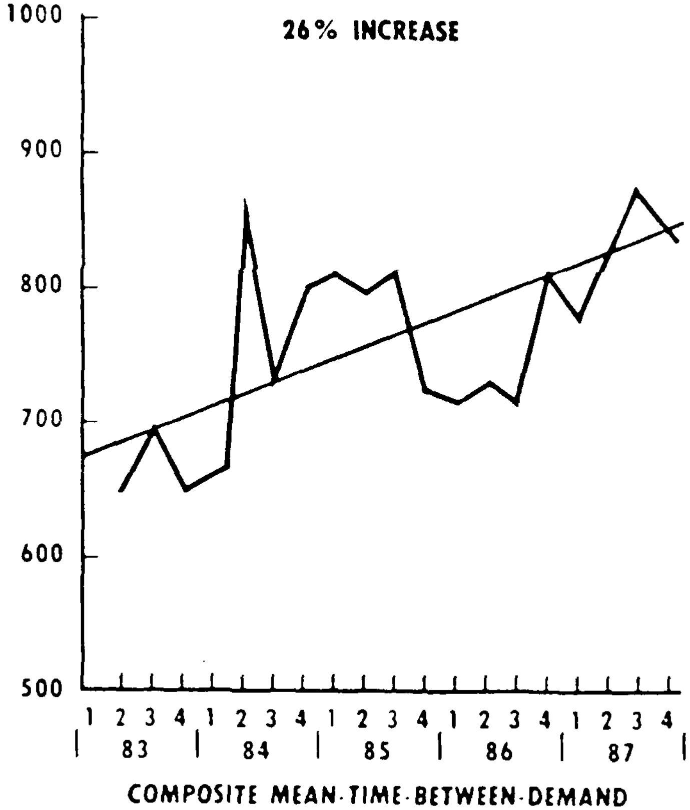
YOU KNOW QUALITY COSTS LESS - NOT MORE!
TAKE THAT MESSAGE TO YOUR WORK PLACE!

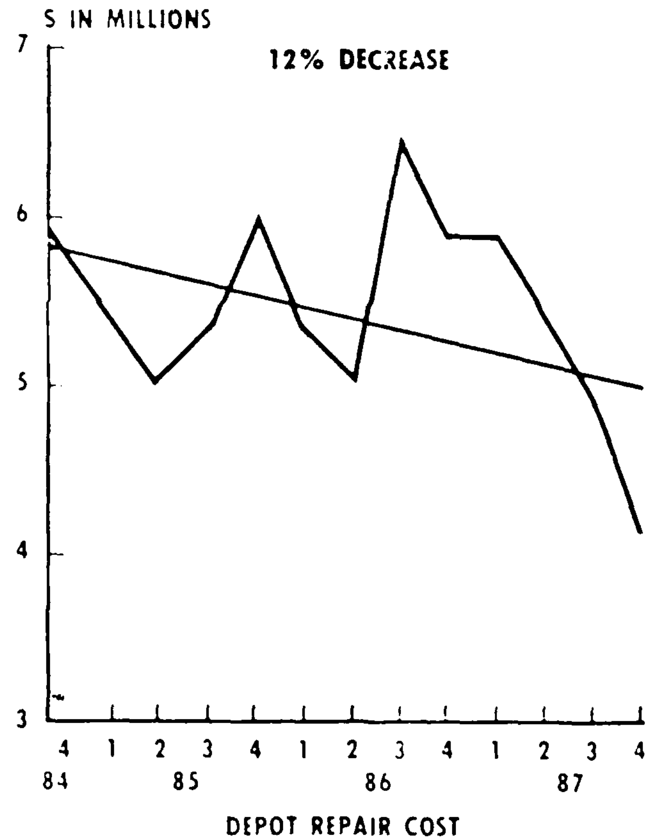
88-4888-4

SA-ALC COMPETITION ADVOCACY PATS

- MARKET SURVEY
  - PROCESS TO IDENTIFY POTENTIAL SOURCES
    - RESULTS
      - COMPLETED 2 JUN 88
      - RECOMMENDATIONS IMPLEMENTED
      - CYCLE TIME REDUCTION 11.5 TO 4.76 DAYS
      - QUALITY IMPROVED BY REQUIREMENT FOR LEAD ANALYST REVIEW
- PRODUCT KNOWLEDGE FILES
  - PROCESS TO PROVIDE BETTER INFORMATION TO BUYERS TO IMPROVE/ EXPEDITE THEIR PRICE NEGOTIATIONS
    - RESULTS
      - COMPLETED 8 JUL 88
      - IMPROVED UNDERSTANDING OF BENEFIT TO BUYERS
      - EXPANSION OF REVIEW TO CURRENT BUYS (RATHER THAN ONLY POTENTIAL BUYS)
      - REDUCED LEAD TIME ON AVAILABILITY OF PRODUCT KNOWLEDGE FILES BY 30%

CONSTANT SPEED DRIVES





PROGRAM EXECUTION
3080 FUNDS

DIVISION OF PROGRAM

	FY86	FY87	FY88
ON-BASE	55%	51%	68%
OFF-BASE	45%	49%	32%

FIRST YEAR OBLIGATION RATE

	FY86	FY87	FY88
ON-BASE	65%	63%	90%
OFF-BASE	42%	33%	84%
TOTAL	55%	48%	88%

TQM AND AFLC QUALITY

- BOTH PROGRAMS CARRY SAME MESSAGES
  - STARTS AT THE TOP - COMMITMENT
  - EVERYONE - PRODUCTS AND SERVICES
  - A KEY HEDGE AGAINST THE FUTURE
  - SERVICE AND INDUSTRY PARTNERSHIPS - A MUST

TQM AND AFLC QUALITY (CONT)

- AFLC UNIQUE CHALLENGES
  - POST PRODUCTION SUPPORT
    - MODIFICATIONS - SPARES - DEPOT MAINTENANCE
    - TECHNOLOGY INSERTION
  - SYSTEM DEVELOPMENT/ACQUISITION
    - GROWING ROLE FOR AFLC
    - MORE EFFICIENT RELATIONSHIP WITH AFSC
    - EARLY ORGANIC CAPABILITY

QUALITY - THE DISCIPLINE

"QP^4 IS NOW A WAY OF LIFE. IT'S NOT JUST A PASSING CLICHE. WE'RE DEAD SERIOUS ABOUT PROVIDING CUSTOMERS WITH A PRODUCT THEY CAN BET THEIR LIFE ON, BECAUSE IN MOST CASES THEY DO!"

DON PYKA
SA-ALC MA

88-4897.

SUMMARY

- **RAPID PROGRESS BEING MADE**
  - BASED ON:
    - TOP DOWN COMMITMENT
    - BOTTOM UP INVOLVEMENT
    - KEY PROCESS ANALYSIS
    - SYSTEMATIC ORGANIZED ATTACK
    - SUCESSFUL CONTRACTOR APPLIED TOOLS
    - HOME GROWN TRAINING
    - PAT - PRIMARY IMPLEMENTATION VEHICLE
  - COMMANDER'S QUALITY VISITS UNDERSCORING AND EXPANDING EXISTING QUALITY INITIATIVES

FINAL REPORT

WORKING GROUP ON ELIMINATION OF FIXED DEFECT LEVELS (ACCEPTABLE QUALITY LEVELS/LOT TOLERANCE PERCENT DEFECTIVE) FROM MILITARY SPECIFICATIONS

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13 July 1988

G. J. THIELEN, CHAIRMAN

Aeronautical Systems Division (AFSC)

ASD/ENSI

Wright-Patterson AFB, OH 45433-6503

(513) 255-3448

ELIMINATING FIXED DEFECT LEVELS FROM GOVERNMENT SPECIFICATIONS

1. ABSTRACT:

This report summarizes results of a multi-service group formed to develop implementation guidance for the OSD policy to eliminate reference to fixed defect levels in military and federal specifications. The group recommends ways to prepare specifications or modify contracts to help achieve current DoD product quality objectives. It shifts the focus of verification and acceptance activities from end-of-line inspections and tests to in-line or off-line manufacturing process controls. Costly tests and inspections are not needed if process variability is sufficiently reduced. By suggesting that objective evidence of controlled manufacturing variability can be an acceptance consideration, it follows that manufacturers having a well-disciplined factory and a record of consistent product quality can be more competitive for both defense and commercial business. The effectiveness of the recommended approach will depend upon on proper accomplishment of several fundamental engineering tasks...

- Identification of important product and process characteristics as a consequence of design analysis and development test activities, and clearly communicating this knowledge to the manufacturing/quality function through the technical data package.

- Producible designs--considering the factory as a "customer" of the designer and specifying engineering tolerances which are compatible with manufacturing capability.

- Simultaneous development of equipment and its manufacturing process, proving the manufacturing process during engineering development and controlling critical processes during production.

- Technical competence of buyers to assess the capability and performance of manufacturers, and to come to practical agreements with sellers on the data needed to establish that a sufficient degree of process control has been achieved.

2. BACKGROUND/PURPOSE/CHARTER:

The Department of Defense Total Quality Management (TQM) initiative includes as one of its four "key success factors" the need to improve Quality Performance Processes. It means that each DoD acquisition activity must understand and apply the engineering processes and technical tools which ensure conformance to specifications and to provide for continuous quality improvement (CQI). DoD's long standing practice of specifying minimum levels of conformance and buying on the basis of price competition alone is not consistent with the TQM concept. When acceptance requirements in contracts and specifications are written with the primary intent of protecting the Government from unknown or incapable manufacturers, the result has been a heavy cost burden for end-of-line inspections and tests. Moreover, the product quality delivered to DoD purchasers is often at the lowest level available in the market.

In contrast, successful commercial enterprises seem to be doing things differently. There is a clear shift in quality control focus from end-of-line sampling inspections and testing to in-line process controls and off-line quality or producibility design activities. Commercial buyers are becoming more knowledgeable of the capabilities of potential suppliers, and are developing stable, long-term business relationships with those with good quality history. Commitment to continuous quality improvement is proving to be a key survival factor in today's most competitive markets.

To encourage and benefit from these commercial trends in military purchasing, a 16 Oct 86 memorandum from the Assistant Secretary of Defense (Acquisition and Logistics) called for the services to remove inappropriate quality acceptance provisions from specifications and standards. Specifically, asking the services to avoid stating quality requirements in terms of Acceptable Quality Level (AQL) and Lot Tolerance Percent Defective (LTPD) in those documents. Use of AQL and LTPD was said to be appropriate only in limited circumstances, and then should be invoked contractually--not through reference to specifications and standards. Subsequently, John A. Mittino, DASD (Logistics) issued memoranda on 11 Mar 87, 16 Jun 87, and 26 Jun 87 requesting the services to proceed with the elimination of AQLs and LTPDs from specifications, to promote the use of statistical process control (SPC), and to move toward the use of total quality management systems to ensure that DoD buys quality products at an affordable price.

The Services and DLA each began actions to implement the OSD guidance. However, their initial actions showed evidence of misunderstanding of OSD intent and surfaced several related issues such as imposing differing acceptance requirements on common suppliers for the same item, the practicality of rejecting a lot based on a single defect without regard to sample size or the importance of the characteristic involved, and questions about when statistical sampling could be applied in performance of defense contracts. A multi-service working group was established to explore all the issues and to develop implementation guidance for the services which would best support overall OSD quality objectives.

The working group's charter outlined in SAF/AQX letter of 29 Feb 88, [see Appendix A] requires the drafting of implementation guidance for DoD purchasers which will encourage process control and continuous quality improvement by manufacturers. It calls for establishing process control statistical data as an alternative to 100% acceptance testing or acceptance sampling. The group's draft guidance was to be discussed with industry and submitted to Departmental Standardization Offices (DepSOs) as interim recommendations before preparing the final guidance to the Services and DLA. Specifically, the group was chartered to...

- Draft recommended revisions to preparers of government specifications including MIL-STD-961, "Military Specifications and Associated Documents, Preparation of," to address the following kinds of specification changes:

-- Sample requirements language for statistical process control (SPC).

-- Deletion of percentage fixed quality levels where economically feasible.

-- Retention of sampling inspection and acceptance testing as required.

-- Other changes deemed appropriate by the working group.

- Explore using a contract clause as an interim fix until such time as specifications and standards are purged of fixed nonconformance levels for acceptance.

- Determine the additional guidance required to be able to effectively use a contract clause to continuously improve quality.

- Provide the Service DepSOs a draft interim guidance policy letter to be sent to the field by 1 Jun 88. The letter to be issued as a coordinated policy letter signed out at a senior level.

3. MEMBERS/PARTICIPANTS:

The working group was initially composed of ten members representing all three Services and DLA. Since the meetings and other activities of the group were held in an atmosphere of openness, several other individuals participated in working group meetings, reviewed draft products and contributed to the formulation of the group's recommendations. Following is a listing of the members and key participants:

- NAVY

-- Mr Eric Kessler	OASN(S&L)/RM&QA

- ARMY

-- Mr Bob Cook	AMCQA-E
-- Mr George Hopkins & Mr Jim Lash	AMCPD-SE
-- Mr Geza Pap	AMSMC-QAH

- AIR FORCE

-- Maj Jean Kopala	SAF/AQXA
-- Mr Ryan Bradley and Mr Cal Garner	SAF/AQCM
-- LtCol Jack Steele	AFLC/QA
-- Mr John Berg	AFLC/PMMQ
-- Major Daugherty and Mr Jim Mathenia	AFSC/PLEQ
-- Mr Keith Payne	ASD/EN(PA)
-- Mr George Thielen [Chairman]	ASD/ENSI

- DEFENSE LOGISTICS AGENCY

-- Mr Don Atkinson	DLA-QL
-- Mr Fred Harris	DLA-SE
-- Mr Bob Schmitt	DLA-Q

4. KEY ACTIVITIES & MILESTONES:

- Organizational meetings at the Pentagon	7 Jan 88 14 Jan 88
- Working group members identified	22 Jan 88
- Charter signed by SAF/AQX	29 Feb 88
- Meetings of working group at Crystal City	3 Mar 88 23 Mar 88 21 Apr 88
- Participation in Government-Industry meeting on alternatives to 100% inspection	30 Mar 88
- Participation in meeting on preparation of a DoD Statistical Process Control (SPC) handbook	31 Mar 88
- Published interim report (charts)	7 Apr 88
- Informed industry (AIA, NSIA) of tentative recommendations	11 Apr 88
- Briefed Air Force Standardization Conference held at Wright-Patterson AFB	22 Apr 88
- Briefed OSD/Department/Agency Defense Standardization Panel at Skyline #2, Falls Church, VA	4 May 88
- Briefed Defense Standardization Council at the Pentagon	10 May 88
- Drafted policy letter for Dr Costello's signature--including summary of group's results	1 Jun 88
- Briefed SAF/AQ, AQC, AQX	13 Jul 88
- Submitted final report to SAF/AQXA	13 Jul 88

5. SUMMARY OF TECHNICAL CONCEPTS:

Through its emphasis on "Total Quality Management" and "Continuous Quality Improvement," OSD has made it clear that "quality" of military products can and should be be improved by applying techniques which have been effective in competitive, commercial industry. Ultimately, quality is measured in terms of user satisfaction and product value. While a few military products may fall short of the user's expectations for performance, many products are subject to criticism for costing too much either to buy or to own.

There is growing recognition that quality improvement efforts must begin with quality-in-design. We feel this idea is particularly applicable

to the purpose of this working group which is to change the content of specifications to emphasize manufacturing process control while reducing our dependence on end-of-line inspections or tests to verify product conformance. We see three essential elements of quality-in-design pertinent to this task: (1) systems engineering for balanced design, (2) identification of important product and process characteristics, and (3) producible designs. Without a solid connection to this kind of engineering work, production-phase activities such as statistical process control will have little overall benefit.

Systems engineering (MIL-STD-499) provides the framework for translating user needs into desired product attributes and then trading-off conflicting desires to come up with optimized technical requirements. A systems engineering process which considers all user needs in a balanced fashion before establishing firm specification requirements is the foundation for a quality product or system.

Supporting engineering analyses and tests can then determine which product and process characteristics directly affect these product attributes in a way that is significant to the user. Examples of such attributes are safety, durability, reliability, cost and essential performance. With this knowledge, a "quality structure" of things that must be controlled during the production phase can be created. Its documentation may take the form of manufacturing plans, assembly flow charts showing where inspection operations take place, process specifications, process control plans, manufacturing work instructions with inspection points, and in-process test procedures.

Producibility requirements can be included in section 3 of a specification to force the designer to consider manufacturing capability before establishing engineering requirements. This is particularly desirable for the "important product and process characteristics" discussed above. For these characteristics, DoD will derive cost and combat capability benefits from product consistency during production. The degree of match between engineering requirements and corresponding manufacturing capability can be quantified using metrics such as "process capability index (Cp)." Process capability index is simply the ratio of the total engineering tolerance to the manufacturing variation (6-sigma). Other producibility factors such as parts count, use of standard parts, choice of materials and fabrication methods, and ease of assembly also need to be considered as an integral part of design tasks. Verification of conformance to producibility requirements can be based on factory experience in building pre-production units or on historical data from comparable manufacturing processes and product designs. Ideally, manufacturing processes are developed and proven in close coordination with equipment design and qualification.

Given that the above quality-in-design issues are addressed, manufacturing's goal is to minimize variability of the processes that reproduce the characteristics required for successful function of the product. When the manufacturing process is controlled to such a degree that variation in specified, important product characteristics is well within stated engineering tolerances, then costly acceptance inspection, sampling or test of those characteristics should be unnecessary. The degree of manufacturing conformance to design requirements can be quantified through the use of terms such as "process performance index (Cpk)." This index compares the

variability and centering of a controlled manufacturing process with the governing design parameter and its tolerance band. If the process mean is within the specification limits, it can be calculated as: Cpk = |process mean minus nearest spec limit|/3 sigma, manufacturing variability. Variables data to support this calculation may be derived from various sources. Among these are control charts created as a consequence of formal statistical process control (SPC) procedures, data obtained from automated or manual inspection, automated non-destructive evaluation, or computer-generated information from machines operating under adaptive controls. In some cases, evidence of control of non-product process variables, as opposed to measuring product characteristics directly, can serve as the basis for assuring consistent process output and product quality.

6. COMMENTS ON STATISTICAL SAMPLING:

The concepts of statistical control of quality and based on the use of sampling plans and Acceptable Quality Levels (AQLs) which originated with engineers such as Dodge and Romig of the Bell System beginning in the 1920s. Also during this time frame, Shewhart, also of the Bell System, developed the initial techniques of statistical process control including control chart methods. This was published in 1931 in his landmark book Economic Control of Manufactured Product.

Statistical sampling plans found wide-spread application in U.S. defense production during World War II. MIL-STD-105 was an outgrowth of this activity and has become the international standard for attribute (go/no-go) sampling. Its sampling plans were never meant to excuse errors or to create a situation where defects are actually acceptable. Statistical sampling was intended to establish reasonable risks to balance the extreme costs and time otherwise required to inspect or test every unit of product.

Consistent product compliance is not possible if engineering specifications and drawings contain unreasonably tight tolerances. In many cases, AQL sampling has been applied knowing that a certain degree of non-conformance to specification requirements has no functional impact. Marking requirements for electronic parts is an example of a requirement which could continue to be verified through AQL sampling. Likewise, in applications of new technology, where materials and processing science is immature, manufacturing yields can be traded off against the performance capability offered by the new device. Until the technical approach described in the previous section is fully understood, accepted and implemented, such conditions will continue to occur in defense acquisition, and the government/industry community will need to apply the inspection, test and sampling techniques appropriate to the specific situation.

All sampling involves risk. A sampling plan is completely defined by the size of the lot, the size of the sample and the "accept number"--the maximum number of sample defectives that will still allow the lot to be accepted. Risk of a specific sampling plan is quantified by an Operating Characteristic (OC) curve. Consumers risk refers to the chance of accepting a lot based on the sample where its true fraction defective is above a certain value. This point on the OC curve is called Lot Tolerance Percent Defective (LTPD) or Limiting Quality (LQ). Producers risk refers the chance of rejecting a lot if its true fraction defective is below a certain level.

This point on the OC curve is called Acceptable Quality Level (AQL). In a typical MIL-STD-105D application, for example, the producer's risk may be 5% that lots better than the specified 2.5% AQL fraction defective will be rejected. On the other hand, the consumers risk might be described as a 10% chance that a lot as bad as 8% defective, the LTPD, would be accepted based on the sample.

The sampling plans in MIL-STD-105 are oriented to AQL or producer's risk. Acceptance numbers of 0, 1, 2, or even 21 are found in its various sampling plans. Non-zero acceptance numbers are a natural consequence of the standard's producer orientation. If factory processes run close to the AQL in terms of fraction non-conforming, then the risk of lot rejection is unacceptably high for producers if only zero acceptance numbers are used.

Today, however, it is not unusual to expect factory non-conformance rates for parts we purchase to be below 1000 parts per million. in such cases, accept-on-zero sampling plans have several advantages over MIL-STD-105 plans. First, they can provide equivalent limiting quality (LTPD) protection using smaller sample sizes. Second, they encourage manufacturer emphasis on process control, since producer's risk (and cost) will rapidly increase if factory processes get beyond the part-per-million range (ie. 1000 ppm). Third, they are less likely to convey the impression that some level of defectiveness is acceptable to the buyer--since there is no acceptable level of defects in the sample. Such plans are useful in allowing management to take a calculated economic risk by sampling, but do not establish a standard which knowingly tolerates defects.

Current emphasis on control of manufacturing variation for important product and process characteristics will tend to force us to deal with actual measured values for these characteristics, rather than just classifying a sampled unit as good or bad. There are sampling plans for dealing with variables data (eg. MIL-STD-414) available for this purpose. Less formal procedures simply tally results of inspections against the corresponding specification tolerance until a picture of the distribution is evident. Some of the acceptance procedures currently being developed by the Electronic Industries Association in support of the DESC parts-per-million quality improvement program are also based on the variables approach. Such sampling plans can also be used to verify attainment of a specified process capability index (Cp) or process performance index Cpk) which will be necessary as DoD quality assurance emphasis shifts away from "assuring conformance" and towards "process control" and "reducing manufacturing variability."

Manufacturers and vendors/distributors of items that go into defense systems are responsible for product conformance including the process controls necessary to keep manufacturing variation well within the limits defined in the engineering specifications. The buyer (government or industry purchasing organization) also has a responsibility to verify that purchased items conform to specification. This verification normally based on the inspections and tests performed by the manufacturer per the acceptance requirements in section 4 of the applicable military specification. It may also involve independent sampling inspection, or test prior to shipment or upon receipt. These inspections and tests by the buyer are not intended to abrogate the original item manufacturer's, vendor's or distributor's contractual responsibilities, but to provide supplemental evidence

that items conform to requirements. The buyer should require that the manufacturer's processes are controlled so that the fraction non-conforming is very low. The buyer's incoming sampling, inspection, or test plans, therefore, should be designed to detect major excursions from this condition. It is not intended that the buyer perform all of the identical quality verification tasks required of the original manufacturer, only a selective check of important product characteristics to establish confidence commensurate with the assigned application category of the item (critical, major, ...etc.). The intent is to verify the sellers compliance with requirements, not to screen his output for him. Statistical sampling as discussed above will continue to be appropriate for this purpose.

7. RECOMMENDATIONS:

The group recommends that the services follow a stepped approach to revising the Government's basis for product acceptance. Some immediate contractual actions are clearly required to overcome the implication of wording in present specifications that some percentage of non-conforming product is "acceptable" or that the Government is obligated to accept non-conforming units if the number found is within specified quality levels. Basing acceptance decisions on process control evidence cannot be implemented until manufacturers and purchasers have the technical capabilities to operate in this enlightened mode. Offering a manufacturing process control alternative while keeping existing acceptance sampling, inspection and test requirements in place will allow for a period of transition giving impetus to those who need the time to develop the methods and techniques required.

STEP 1 CONTRACT LANGUAGE [IMMEDIATE IMPACT...UNIVERSAL APPLICATION]

Use contract language such as shown below in all new contracts and contract modifications for items purchased to specifications which call out acceptance sampling plans as the means to verify conformance to design or performance requirements. Such language should be added to the contract's general provisions or section of equivalent precedence to effectively supersede contract specification requirements. This language, and the language suggested in STEP 2 below, is not meant to be final. It can be tailored to fit the circumstances of the purchase involved, and should be submitted for legal review prior to incorporation in the contract.

> The statement of an Acceptable Quality Level (AQL), Lot Tolerance Percent Defective (LTPD), or any other expression of "consumer's" or "producer's" risk in any specification, standard, drawing or other part of the technical data incorporated in this contract, either directly or by reference, represents the determination by the original preparing activity of an amount of risk acceptable to that agency at the time of preparation and does not apply to this contract. Statements of risk associated with inspection sampling as described above may be used, at the contractor's own risk, as a guide to the maximum risk which the Government may be willing to accept; however, these statements are not binding on the Government and do not obligate the Government to accept lots of material or individual items which are non-conforming regardless of whether the lot or item is within the allowable risk zone (AQL or LTPD), nor does the acceptance of a lot or batch based upon an AQL

or LTPD obligate the Government to utilize the same sampling plan, AQL or LTPD in future lots under the same conditions. In cases where sampling inspection is used to determine process or lot acceptability based upon sampling of a characteristic, any non-conformance found must be corrected regardless of whether or not the item or lot is determined to be acceptable based upon the sample. Any statement of such risk, to be binding on the Government, must appear in a separate clause appended to this section of the contract.

STEP 2 CONTRACT LANGUAGE [NEAR-TERM IMPACT...BROAD APPLICATION]

To offer manufacturers a lower cost alternative to specified acceptance sampling or other end-of-line inspections or tests, purchasing activities having adequate technical support should consider use of contract language such as shown below in addition to the language shown above for STEP 1. It allows evidence of controlled manufacturing processes for important product and/or process characteristics to be a Government acceptance consideration. Manufacturers that control factory processes, consistently deliver quality products and are committed to continuous improvement can thereby be more competitive for defense as well as commercial business. In time, as specifications are modified to include this acceptance alternative, the use of this special contract provision will no longer be necessary.

As a lower-cost alternative to some or all of the sampling inspections specified in the technical data package, the manufacturer is encouraged to offer objective evidence of controlled manufacturing processes and continuing product improvement. Such evidence shall demonstrate achievement and maintenance of a process performance index (Cpk) of at least _______ [Fill in the blank with a realistic Cpk value considering impact of product non-conformance, design stability, process maturity, and capability of available manufacturing machinery.] for specified product characteristics or performance requirements historically verified through sampling. Evidence may be in the form of control charts derived from application of statistical process control (SPC), or variables data from automated or manual inspection, non-destructive evaluation, data from machines operating under adaptive controls or periodic testing of production samples. The decision to accept the process control evidence as a suitable alternative to specified sampling inspections or tests shall be at the discretion of the purchasing activity. It will be influenced by the manufacturer's product quality record, observed commitment to continuous quality improvement, and conformance to applicable quality system requirements (eg. MIL-I 45208, MIL-Q-9858).

NOTE: process performance index compares the variability and centering of a controlled manufacturing process with the governing design parameter and its tolerance band. If the process mean is within the specification limits, the process performance index can be calculated simply as follows:

$$\text{Cpk} = \frac{|(\text{process mean} - \text{nearest specification limit})|}{\text{3 sigma, manufacturing variability}}$$

STEP 3 CONTRACT LANGUAGE [NEAR-TERM IMPACT...VERY SELECT APPLICATION]

Under special circumstances, purchasers may find it useful to use the contract statement of work to direct the application of specific quality engineering tools and techniques such as statistical process control (SPC), designed experiments, or Taguchi methods. In general, requirements should focus on the desired objectives rather than on how to achieve them. Where there is no competition and a the supplier needs explicit technical direction and funding to incorporate basic quality control technology, such requirements may be appropriate.

STEP 4 SPECIFICATION FORMAT [LASTING IMPACT...BROAD APPLICATION]

Several additional changes to MIL-STD-961C which governs the format of all military specifications are suggested as the primary, long-term solution to the perceived problems with specified acceptance requirements. The changes recommended by the working group are based on the December 1986 draft of MIL-STD-961C and are shown in Appendix B to this report. The changes address...

- design consideration of manufacturing capability
- qualification of manufacturing processes
- identification of important product/process characteristics
- manufacturer responsibility for control of product variability
- the alternate (process control) basis for verification and product acceptance

CONTINUED USE OF SAMPLING:

There will continue to be acceptable applications of sampling inspection or test which call for proper selection of plans to conform to desired decision risks. Such applications should not be interpreted as inconsistent with current DoD policy. Specifically, the working group recommends the following guidelines be issued as DoD policy with regard to sampling:

- Manufacturers may continue to use sampling plans to ascertain conformance as a part of their in-line or end-of-line quality control activities.

- Sampling plans can be used by Government representatives to verify conformance in-line or to inspect finished products.

- Specific sampling plans may continue to be specified in section 4 of product specifications in cases where other verification alternatives are impractical such as environmental or functional testing which is destructive in nature. Traditional sampling verification requirements will also continue to be appropriate when applied to "minor" characteristics--

those which do not substantially affect performance, safety, reliability, durability or supportability of the product.

- Sampling plans will not otherwise be included in section 4 of specifications so as to limit the extent of the Government's verification or to obligate the Government to accept any fixed level of defective or non-conforming product.

- The use of "accept-on-zero" sampling plans is encouraged when producible designs and controlled processes reasonably support expectation of process nonconformance rates below 1000 parts per million.

- To keep sample sizes practical, sampling plans using variables data (actual measurements versus go/no-go) should be considered in verifying nonconformance levels in the low parts-per-million range.

IDENTIFY IMPORTANT CHARACTERISTICS:

Engineering knowledge about product and process characteristics which directly affect performance, safety, reliability and durability needs to be documented in the technical data package and clearly communicated to the manufacturing and quality functions. This information can be derived from the results of other engineering tasks (such as FMECA or hazard analyses) or developed as a consequence of analytical design tasks or designed experiments during development testing. Documentation may take the form of "classification of characteristics," listings or notes on the engineering drawings.

DESIGN FOR PRODUCIBILITY:

During design, important product characteristics should be matched to corresponding capability of the factory process that produces those characteristics. The degree of match can be quantified and managed through parameters such as "process capability index (Cp)." Other producibility factors such as parts count, use of standard parts, choice of materials and fabrication methods, and ease of assembly also need to be considered as an integral part of design tasks.

NOTE: Process capability index is simply the ratio of the total engineering tolerance to the manufacturing process variation (6 sigma). It measures the process' potential for meeting the design requirements, but, unlike Cpk, ignores the centering or targeting of the process mean. It is more appropriate as a design producibility metric than as a measure of factory performance.

QUALIFY AND CONTROL MANUFACTURING PROCESSES:

Develop and qualify manufacturing processes in parallel with equipment development. During production, ensure that manufacturing processes are controlled. Statistical process control (SPC) is one of several techniques available for this purpose. There should be agreements between buyers and sellers as to data needed to prove processes and to demonstrate control.

REDUCE MANUFACTURING VARIABILITY AS PART OF CQI:

Where it benefits product safety, performance, durability, reliability or cost, quality improvement efforts should strive for continuous reduction in manufacturing variability relative to engineering tolerances. Manufacturing achievement can be tracked and managed through use of metrics such as "process performance index (Cpk)." These considerations should be made an integral part of formal Continuous Quality Improvement (CQI) or Total Quality Management efforts.

TRAIN TECHNICAL PERSONNEL:

Engineers and technical specialists should be familiar with concepts of variability--including how to specify, measure and control it. The quality technologies which help determine cause-and-effect relationships, optimize designs, and structure production-phase manufacturing controls need to be widely understood and properly applied within both government and contractor organizations.

The recommendations outlined above are necessarily very general in nature. We recognize that they must apply to all the products purchased by DoD ranging from commercial, non-developmental items such as lawn mowers to engineering development of the B-2 advanced technology bomber. To properly flesh-out and tailor these recommendations in an effective manner, DoD purchasing activities will need competent technical support. The underlying quality technology is basically "off-the-shelf," but its application cannot be reduced to universal contract clauses, check lists, or handbook procedures. Moreover, there is no single tool which is a panacea for improving product quality and affordability. But, dramatic improvements are possible through professionally-guided application of existing tools and techniques.

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8. OTHER NEEDED ACTION:

The following items were recognized by the working group as needing additional work to enable implementation of our recommended approach. Completion of this work was beyond the scope of the ad hoc group considering its time constraints and the part-time resources available to this project.

a. Several other specifications and standards should be reviewed to see if modifications are necessary to make them consistent with the working group's recommended changes to MIL-STD-961 and the technical process described in this report. Among these are:

-- MIL-STD-962, which governs preparation of military standards. Many standards discuss the use of sampling plans, so treatment of the sampling issue may be needed in this document.

-- DOD-D-1000 and DOD-STD-100 which govern the preparation of engineering drawings. Requirements for indication of part application categories and for identification of important product and process characteristics may need to be added to these documents.

-- MIL-STD-490, Specification Practices, may need to be modified to reflect the impact of the recommended MIL-STD-961 changes on specifications for program-peculiar configuration items, processes, and materials.

-- MIL-STD-499, which describes the systems engineering process may need to be expanded in the "ilities" and manufacturing areas to reflect the key technical tasks described in this report and their relationship to the overall process of translating an military operational need into an affodable and effective system solution.

b. All existing military specifications now including sampling requirements (AQLs/LTPDs) in section 4 as a basis for product acceptance will need to be reviewed for consistency with the published changes to MIL-STD-961.

c. A supporting guidance document, handbook or pamphlet should be prepared to aid government and industry purchasing and engineering personnel in understanding and economically implementing the technical process and concepts described in this report.

APPENDICES

DEPARTMENT OF THE AIR FORCE
WASHINGTON, D.C. 20330-1000

OFFICE OF THE ASSISTANT SECRETARY

FEB 2 5 1988

MEMORANDUM FOR THE DEPUTY ASSISTANT SECRETARY OF DEFENSE (PRODUCTION SUPPORT), DIRECTOR INDUSTRIAL PRODUCTIVITY AND QUALITY - INFORMATION MEMORANDUM

SUBJECT: Removing Acceptable Quality Levels (AQLs) and Lot Tolerance Percent Defective (LTPDs) from Military and Federal Specifications (OASD[P&L]/DPSO Ltr, 6 Jan 88)

Since receiving the subject memorandum, we have met with Air Force, Army, Navy and DLA representatives skilled in the acquisition and logistics matters involved in the AQL/LTPD sampling issue. Together, we formulated a plan which can provide the Services with a common approach to meeting the new DoD quality objective--a shift in emphasis from end-of-line product inspection or testing to manufacturing process control as the primary means of achieving product quality improvement. We believe that this plan is consistent with the guidance and suggested approach outlined in the 6 Jan 88 Memorandum.

The Services and DLA are committed to the concept of Continuous Quality Improvement (CQI). This commitment is reflected in a broad range of initiatives ranging from manufacturing efforts to reducing the costs associated with nonconforming material to the creation of formal engineering processes which will add substantively to our capability to achieve quality by design. The effect of part quality on weapon system reliability has also been widely appreciated. Process control is recognized as an important determinant of part reliability that can be influenced by government specifications and purchasing practices. There are several DLA and Service initiatives underway which are geared to reducing defective part levels using Parts-Per-Million (PPM) as the method to specify quality levels.

In line with this thinking, the Services are planning a common approach to eliminate fixed defect levels inherent in terms like AQL and LPTD in all but those cases where such removal would incur unreasonable expense to the Government. The Services will eliminate these references but will continue to use statistical sampling as a means of gathering product and process control data as well as for acceptance. Nevertheless, a change in how we specify and contract for part quality is due in order to send a clear message to industry that DoD expects continuous quality improvement from its suppliers.

An ad hoc working group of the Services and DLA has been formed to draft the implementation guidance for DoD purchasers which will encourage process control and continuous quality improvement by manufacturers. Production process control statistical data can serve as a basis for government product acceptance as an alternative to 100% acceptance testing or sampling inspection for products delivered directly to the Government by the manufacturer. The draft guidance will be discussed with industry and submitted to the Service Departmental Standardization Offices (DepSOs) by 4 Apr 88. This recommended guidance will then be coordinated with the Services, DLA and industry by 1 Jun 88. The group is made up of ten members representing all three Services and DLA. The chairman is Mr. George Thielen, Chief, Product Assurance Engineering Division, Aeronautical Systems Division (AFSC), AV 785-3448.

Specifically, the working group's charter is to:

1. Draft recommended revisions to specification guidance (MIL-STD-961 and DoD 4120.3-M plus other documents as required), to address the following kinds of specification changes:

a. Sample requirements language for Statistical Process Control (SPC).

b. Deletion of percentage fixed quality levels where economically feasible.

c. Retention of sampling inspection and acceptance testing as required. When retained, provide amplified discussion and rationale in Section 6, Notes.

d. Other changes deemed appropriate by the working group.

2. Explore using a proposed contract clause as an interim fix until such time as specifications and standards are purged of fixed levels of acceptance.

3. Determine the additional guidance required to be able to effectively use a contract clause to continuously improve quality.

4. Provide the Service DepSOs a draft interim guidance policy letter to be sent to the field by 1 Jun 88. The letter should be a coordinated policy letter signed out at a senior level by the Services and DLA.

We plan to keep you informed about our progress. Should you have any questions, please contact our working group leader, Mr. George Thielen, AV 785-3448. This is a coordinated Service/ DLA Standardization Executive letter.

cc: OASD(P&L)SDM

Thomas W Honeywill

THOMAS W. HONEYWILL, Brig Gen, USAF
Director, Program Planning and Integration
Assistant Secretary (Acquisition)

MAR 0 3 1988

APPENDIX B

AD HOC WORKING GROUP FOR ELIMINATION OF FIXED DEFECT LEVELS

FROM MILITARY SPECIFICATIONS

RECOMMENDED CHANGES TO MIL-STD-961C, DRAFT, DEC 86

AS OF 6 JUNE 1988

5.3 Sectional arrangement of a specification. A specification shall contain six numbered sections, titled and numbered as shown (see 6.4).

1. SCOPE
2. APPLICABLE DOCUMENTS
3. REQUIREMENTS
4. VERIFICATION PROVISIONS
5. PACKAGING
6. *INFORMATION FOR GUIDANCE ONLY*

5.3.1 SECTION 1 [no changes]

5.3.2 SECTION 2 [no changes]

5.3.3 SECTION 3

5.3.3.1 Requirements. [no changes]

5.3.3.2 Qualification. [no changes]

5.3.3.3 Reliability. [no changes]

5.3.3.4 Standard sample. [no changes]

5.3.3.5 First article. [no changes]

5.3.3.6 Materials. [no changes]

5.3.3.7 Design. [no changes]

5.3.3.8 Construction [no changes]

5.3.3.X Producibility. Specifications governing design of equipment should require the contractor/manufacurer to choose the fabrication techniques, design parameters, and tolerances which, where practical and consistent with the state-of-the-art, enable the product to be fabricated, assembled, inspected and tested economically and with repeatable quality. Product and process characteristics having a direct relationship to safety, performance, durability or supportability shall be matched to corresponding manufacturing capability. A numerical value for process capability index (Cp) may be

specified for assessing this compatibility as a process qualification requirement. [Typically, a Cp value of 1.33 is considered to be indicative of a capable process. With Cp = 1.33, the design tolerance equates to 8 sigma of the manufacturing variability resulting in an expected manufacturing nonconformance level of only 64 parts per million—if the process remains perfectly centered during production. Higher values of Cp may be specified for critical characteristics such as those affecting product safety.]

Also consider specifying the following. Consistent with potential production quantities, the equipment design shall be compatible with automated or semi-automated manufacturing and inspection processes. In addition, the design shall be suitable for manufacture by other comparable contractors or manufacturers without comprehensive production engineering changes.

5.3.3.9 Hardware. [re-number this and subsequent items in sec 5.3.3]

5.3.4 SECTION 4

5.3.4.1 Verification provisions. Section 4 shall include all verifications (by reference when applicable) to be performed in order to determine that the item or service to be offered for acceptance conforms to the requirements in sections 3 and 5 of the specification (see figure 6).

5.3.4.2 Responsibility for control of product quality. The Department of Defense concept of quality assurance is predicated on the fact that responsibility rests upon the contractors/manufacturers for controlling product quality and for offering to the military services for acceptance only those items or lots of items that conform to contractual requirements. See also 4.7 for the complete exclusion of administrative and contractual clauses not properly a part of the specification. Accordingly, the contractor/manufacturer responsibility shall be clearly stated by including the following statements as the initial paragraphs in section 4:

> 4.1 Responsibility for control of product quality. The contractor is responsible for all actions necessary to ensure that the delivered product consistently meets the requirements stated in sections 3 and 5.
>
> 4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The contractor/manufacturer's overall quality program or inspection system shall effectively control variation in materials, parts, manufacturing processes, and assembly operations so that the specified product characteristics are consistently met, and that variability around optimal engineering nominal values, where they are specified, is continually reduced. The absence of any specific examinations or tests in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with requirements of the contract. Sampling in verifying conformance does not authorize submission of known defective material, nor does it commit the Government to acceptance of defective material.
>
> 4.1.2 Responsibility for verification. Unless otherwise specified in the contract or purchase order, the contractor/manufacturer is responsible for all inspections, examinations or tests as specified

herein. Except as specified in the contract or purchase order, the contractor/manufacturer may use his own or any other facilities suitable for the performance of the verification actions required herein, unless disapproved by the Government under signature of the Contracting Officer. The Government reserves the right to perform any of the inspections, examinations or tests set forth in the specification where such verification is deemed necessary to ensure supplies and services conform to prescribed requirements.

5.3.4.3 Classification of verification actions. Where section 4 of the specification includes specific verifications such as qualification, first article, or pilot model, an outline of such verifications shall be included as the second paragraph of section 4 as illustrated in the following examples:

Example A;

> 4.2 Classification of verification requirements. The verification requirements specified herein are classified as follows:
>
> a. Qualification verification (see 4.3)
>
> b. Quality conformance verification (see 4.4)
>
> c. Process control verification (see 4.5)

Example B:

> 4.2 Classification of verification requirements. The verification requirements specified herein are classified as follows:
>
> a. First Article Inspection (see 4.4)
>
> b. Quality conformance verification (see 4.5)
>
> c. Process control verification (see 4.6)

5.3.4.4 [no changes]

5.3.4.5 Verification conditions. The environmental conditions under which all verifications (qualification, first article, quality conformance, process control or other verifications) are performed shall be specified as follows:

> 4.3 Verification conditions. Unless otherwise specified, all verifications shall be performed in accordance with the test conditions specified in ...

5.3.4.6 [no changes]

5.3.4.7 Qualification verification. When section 3 of the specification specifies a qualification requirement, section 4 shall include a description of the verification routine, sequence of tests, number of units to be tested, data required and the criteria for determining conformance to the requirement specified.

5.3.4.8 [no changes]

5.3.4.9 Tabulation of examinations and tests. When the tests specified for such qualification inspection requirements differ from the tests specified for quality conformance, the applicable tests shall be presented in tabular form with appropriate reference to corresponding technical requirements and test methods.

[add and renumber subsequent paragraphs]

5.3.4.X Producibility verification. Compatibility of important product and process characteristics with manufacturing capability shall be assessed in terms of performance capability index. All processes used in production of such characteristics shall be demonstrated to have attained a process capability index in excess of that specified in section 3. This demonstration will be based on factory experience in building pre-production units or on comparable historical data.

5.3.4.10 Quality conformance verification. The examinations and tests listed in section 4 of the specification to determine conformance with sections 3 and 5 requirements, shall include, when necessary, a measurement or comparison with specified characteristics and checks and tests of the performance and reliability requirements. [xxx] Since each specification item must meet all sections 3 and 5 requirements, the test methods in section 4 of the specification document are the minimum inspection and test methods to be used to demonstrate compliance to the specification requirements.

5.3.4.10.1 Quality conformance inspection sampling. Sampling inspection shall not be specified as criteria for acceptance of the product by the Government. When it is required to specify the sampling procedure to be used by contractors/manufacturers to ascertain quality conformance during manufacturing, the sampling procedure should impose no inspection procedures that are less efficient and effective than would normally be used by the industry.

5.3.4.11 Classification of quality conformance verifications. Quality conformance verifications shall be classified into groups A, B, C, or D in accordance with the following groupings, when applicable:

Group A - ...

Group B - ...

Group C - ...

5.3.4.12 Tabular listing of quality conformance verifications. ...

5.3.4.13 Noncompliance. [no changes]

5.3.4.14 [added]Process control verification. As a lower-cost alternative to some or all of the above quality conformance verifications, provision should be made for the contractor/manufacturer to offer evidence that his manufacturing process is controlled to such a degree that variation in

specified, important product characteristics is well within the stated engineering tolerances. The degree of manufacturing conformance to design requirements can be quantified through use of terms such as a process process performance index (Cpk) which can be included as a specified value for this acceptance alternative. [Process performance index is defined as the following ratio: Cpk = (process mean minus nearest spec limit)/(3 sigma manufacturing variability)] Evidence can be in various forms such as control charts created as a part of a formal application of statistical process control (SPC), or variables data obtained from automated inspection, automated non-destructive evaluation, or from computer-generated information from machines operating under adaptive controls. Such evidence must be acceptable to the Government purchaser or cognizant Government Representative. An example of such a provision is as follows:

> 4.6 Process control verification. As an alternative to some or all of the examinations of each unit specified in 4.5 and the tests of each unit specified in 4.7, the manufacturer is encouraged to offer objective evidence of controlled manufacturing processes. Such evidence should demonstrate achievement and maintenance of a process performance index (Cpk) of at least 1.33 for all major product characteristics specified in 3.2 and performance requirements specified in 3.6. Evidence may be in the form of control charts derived from application of statistical process control (SPC), or variables data from manual or automated inspection, non-destructive evaluation, data from machines operating under adaptive controls or periodic testing of production samples. The decision to accept the process control evidence as a suitable alternative to other examinations or tests will be at the discretion of the purchasing activity. It will be influenced by the manufacturer's product quality record, observed commitment to continuous quality improvement, and conformance to applicable quality system requirements (eg. MIL-I 45208, MIL-Q-9858).

5.3.5 SECTION 5 [no changes]

5.3.6 SECTION 6

Rev: 880606/ENSI/GJT

MEMORANDUM FOR

SUBJECT: Removing Fixed Defect Levels from Specifications

The DOD Total Quality Management (TQM) initiative includes as one of its four "key success factors" the need to improve Quality Performance Processes. It requires that each DOD acquisition activity understand and apply the engineering processes and technical tools which ensure conformance to specifications and provide for continuous quality improvement. The long standing practice of specifying minimum levels of conformance and buying on the basis of price competition alone must change. When acceptance requirements in our contracts and specifications are written with the sole intent of protecting us from unknown or incapable manufacturers, the result has been a heavy cost burden for end-of-line inspections and tests...and product quality which is often the lowest common denominator in its industry.

In successful commercial enterprises, we see some interesting trends. There is a clear shift in quality control focus from end-of-line sampling inspections and tests to in-line process controls and off-line quality or producibility design activities. Commercial buyers are more knowledgeable of the capabilities of potential suppliers, and are developing stable, long-term business relationships with those with good quality history. Commitment to continuous quality improvement is proving to be a key survival factor in today's most competitive markets. To encourage and benefit from these trends in defense purchasing, OSD directed that fixed defect levels be eliminated from government specifications.

A multi-service group has been working to develop a product acceptance alternative which is based on evidence of controlled manufacturing processes. They have also suggested contract language for neutralizing the implication in present specifications that fixed levels of defects are acceptable. Their recommendations are summarized in the attachment. Please incorporate this approach in conjunction with the related initiatives that I recognize as already underway in this area.

-- EXECUTIVE SUMMARY --
GUIDANCE FOR ELIMINATING FIXED DEFECT LEVELS (AQLs/LTPDs) FROM MILITARY AND FEDERAL SPECIFICATIONS

1. Incorporate contract language to neutralize AQL/LTPD connotations.

Because many existing specifications call out acceptance sampling plans as the means to verify conformance to design/performance requirements, and because such plans quantify sampling risk by reference to an AQL or LTPD, such requirements are often interpreted as the Government's willingness or obligation to accept a fixed percent of nonconforming product. To neutralize this connotation and convey current DoD quality expectations, contracts for items purchased to such specifications should include language such as shown at Attachment 1.

2. Offer a lower-cost, higher-quality basis for product acceptance.

To offer manufacturers a lower cost alternative to specified acceptance sampling or other end-of-line inspections or tests, purchasing activities having adequate technical support should consider use of contract language such as shown at Attachment 2 in addition to the language at Attachment 1. It allows evidence of controlled manufacturing processes for important product and/or process characteristics to be a Government acceptance consideration. Manufacturers that control factory processes and consistently delivery quality products and are committed to continuous improvement can thereby be more competitive for defense business. In time, as specifications are modified to include this acceptance alternative, the use of this special contract provision will no longer be necessary.

3. *Continue to use sampling techniques where they are appropriate.*

There will continue to be acceptable applications of sampling inspection or test which call for proper selection of plans to conform to desired decision risks. Such applications are not prohibited by current DoD policy. Specifically...

a. Manufacturers may continue to use sampling plans to ascertain conformance as a part of their in-line or end-of-line quality control activities.

b. Sampling plans can be used by Government representatives to verify conformance in-line or to inspect finished products.

c. Specific sampling plans may continue to be specified in section 4 of product specifications in cases where other verification alternatives are impractical such as environmental or functional testing which is destructive in nature. Traditional sampling verification requirements will also continue to be appropriate when applied to "minor" characteristics--those which do not substantially affect performance, safety, reliability, durability or supportability of the product.

d. Sampling plans will not otherwise be included in section 4 of specifications so as to limit the extent of the Government's verification or to obligate the Government to accept any fixed level of defective or nonconforming product.

e. The use of "accept-on-zero" sampling plans is encouraged when producible designs and controlled processes reasonably support expectation of process nonconformance rates below 1000 parts per million.

f. To keep sample sizes practical, sampling plans using variables data (actual measurements versus go/no-go) should be considered in verifying nonconformance levels in the low parts-per-million range.

4. Communicate important product and process characteristics.

Engineering knowledge about product and process characteristics which directly affect performance, safety, reliability and durability needs to be documented in the technical data package and clearly communicated to the manufacturing and quality functions. This information can be derived from the results of other engineering tasks (such as FMECA or hazard analyses) or developed as a consequence of analytical design tasks or designed experiments during development testing. Documentation may take the form of "classification of characteristics," listings or notes on the engineering drawings.

5. Design for producibility.

During design, important product characteristics should be matched to corresponding capability of the factory process that produces those characteristics. The degree of match can be quantified and managed through parameters such as "process capability index (Cp)." Other producibility factors such as parts count, use of standard parts, choice of materials and fabrication methods, and ease of assembly also need to be considered as an integral part of design tasks.

6. Qualify and control manufacturing processes.

Develop and qualify manufacuring processes in parallel with equipment development. During production, ensure that manufacturing processes are controlled. Statistical process control (SPC) is one of several techniques available for this purpose. There should be agreements between buyers and sellers as to data needed to prove processes and to demonstrate control.

7. Reduce manufacturing variability as a part of CQI efforts.

Where it benefits product safety, performance, durability, reliability or cost, quality improvement efforts should strive for continuous reduction in manufacturing variability relative to engineering tolerances. Manufacturing achievement can be tracked and managed through use of metrics such as "process performance index (Cpk)."

8. Train technical personnel.

Engineers and technical specialists should be familiar with concepts of variability--including how to specify, measure and control it. The quality technologies which help determine cause-and-effect relationships, optimize designs, and structure production-phase manufacturing controls need to be widely understood and properly applied.

PROPOSED CONTRACT LANGUAGE - PART I

The statement of an Acceptable Quality Level (AQL), Lot Tolerance Percent Defective (LTPD), or any other expression of "consumer's" or "producer's" risk in any specification, standard, drawing or other part of the technical data incorporated in this contract, either directly or by reference, represents the determination by the original preparing activity of an amount of risk acceptable to that agency at the time of preparation and does not apply to this contract. Statements of risk associated with inspection sampling as described above may be used, at the contractor's own risk, as a guide to the maximum risk which the Government may be willing to accept; however, these statements are not binding on the Government and do not obligate the Government to accept lots of material or individual items which are non-conforming regardless of whether the lot or item is within the allowable risk zone (AQL or LTPD), nor does the acceptance of a lot or batch based upon an AQL or LTPD obligate the Government to utilize the same sampling plan, AQL or LTPD in future lots under the same conditions. In cases where sampling inspection is used to determine process or lot acceptability based upon sampling of a characteristic, any non-conformances found must be corrected regardless of whether or not the item or lot is determined to be acceptable based upon the sample. Any statement of such risk, to be binding on the Government, must appear in a separate clause appended to this section of the contract.

PROPOSED CONTRACT LANGUAGE - PART II

As a lower-cost alternative to some or all of the sampling inspections specified in the technical data package, the manufacturer is encouraged to offer objective evidence of controlled manufacturing processes and continuing product improvement. Such evidence shall demonstrate achievement and maintenance of a process performance index (Cpk) of at least ______ [Fill in the blank with a realistic Cpk value considering impact of product non-conformance, design stability, process maturity, and capability of available manufacturing machinery.] for specified product characteristics or performance requirements historically verified through sampling. Evidence may be in the form of control charts derived from application of statistical process control (SPC), or variables data from automated or manual inspection, non-destructive evaluation, data from machines operating under adaptive controls or periodic testing of production samples. The decision to accept the process control evidence as a suitable alternative to specified sampling inspections or tests shall be at the discretion of the purchasing activity. It will be influenced by the manufacturer's product quality record, observed commitment to continuous quality improvement, and conformance to applicable quality system requirements (eg. MIL-I 45208, MIL-Q-9858).

NOTE: process performance index compares the variability and centering of a controlled manufacturing process with the governing design parameter and its tolerance band.

$$\text{Cpk} = \frac{\text{(process mean - nearest specification limit)}}{\text{3 sigma, manufacturing variability}}$$

APPENDIX D -- SUMMARY OF INDUSTRY FEEDBACK

Company A:

- "...orders of magnitude better than the other proposals on this issue"
- some inconsistencies, statistical inaccuracies, and contractual conditions that would create unjustifiable cost impacts

[detailed comments, many of which indicate a need for a supporting pamphlet or handbook to better convey our intent and the proper application of the available tools and measures]

Company B:

- philosophical agreement, ambitious project, but addresses the necessary fundamentals for controlling such a system, will help motivate industry, can only improve productivity in the long run

- need for keeping sampling and process control alternatives for a period of transition, since much of industry lacks capability for controlling their manufacturing processes as outlined in our report

- eliminate interpretation issues by providing a standardized manufacturing process control guideline document

- understand measurement system contribution to apparent product variation...needs to be addressed separately in our documentation

- less stringent controls appropriate for capable, stable, long-term production runs

- evidence of control of non-product (process) variables also is an acceptable means for ensuring consistent product quality

- may be difficult to administer our recommendations--need to focus on a minimum number of characteristics

- contract administration personnel will need to be trained and proficient in process control methodology

Company C:

- continue to be acceptable applications of sampling inspection or test which call for proper selection of plans to conform to desired decision risks...should not be banned...otherwise large cost increases agree]

- don't confuse section 3 requirements with section 4 verifications

- proposed process capability techniques may not be appropriate for control of attribute data ...subject to same statistical criticisms as AQL

- strongly oppose negotiation of AQL on a contract-by-contract basis, nightmare in a multi-customer plant

Company D:

- contract clause generally acceptable

- how to determine Cp when it is not known who will produce product?

- retain existing AQL acceptance option for those suppliers without an SPC program

- how will important product & process characteristics be determined?

- provide for CAS withdrawl after SPC and process indices are established and acceptable

Company E:

- agree with overall intent

- continual reduction in variability may be impractical

- may not apply to attribute parameters such as solder joint quality...need to tie into govt-industry working group on this subject

Company F:

- changes to 961C will encourage inclusion of "how to" in specs... inconsistent with "Acquisition Streamlining"...recommend against

Company G:

- proposed contract clauses are acceptable

- concern about requirement to continually reduce variability...could be interpreted to mean "to infinity"

- some contractors do not have a mature SPC program, could take years, may inhibit contractor acceptance of the document

Company H:

- clarify who specifies product characteristics

- use "important" or "major", not both terms

- continual variability reduction only when a process improvement is needed for an item or its next higher assembly to meet contract dimensional, test or field performance/reliability requirements

- applicability to process specs as well as product specs?

- concern about unrealistic interpretations by DCAS...get services involved in designation of characteristics to be measured by Cpk and in DCAS monitoring instructions

NATIONAL SECURITY INDUSTRIAL ASSOCIATION

National Headquarters

1025 Connecticut Avenue, N.W.
Suite 300
Washington, D.C. 20036
Telephone: (202) 775-1440

9 May 1988

Mr. George J. Thielen
Chief, Product Assurance Engineering Division
Directorate of Systems Engineering
Department of the Air Force
Headquarters Aeronautical Systems Division (AFSC)
Wright-Patterson Air Force Base, Ohio 45433-6503

Dear Mr. Thielen:

This letter responds to your request of 7 April 1988, to Mr. Jim Mayben, chairman of NSIA's Quality and Reliability Assurance Committee (QRAC). You asked for NSIA/QRAC comments regarding the removal of AQLs and LTPDs from military and federal specifications.

Enclosed for your consideration are the comments that were submitted in response to the request for review. No attempt was made to consolidate or put them into an order of priority.

Please let me know if you have any questions or need additional information.

Sincerely,

Alonza L. Caldwell

Alonza L. Caldwell
Committee Executive

Enclosures:
Response from:
1. Hughes
2. TI
3. ITT
4. Harris
5. McDonnell Douglas
6. General Dynamics
7. Hamilton Standard

ALC:plv

Aerospace
Industries
Association

June 2, 1988

Mr. George J. Thielen
Directorate of Systems Engineering
ASD/ENSI
Wright-Patterson AFB, Ohio 45433-6503

Dear George,

Subsequent to my letter of May 16, 1988, additional comments were received. These are forwarded for your consideration.

A subcommittee of our Quality Assurance Committee has reviewed the proposed contract clause and proposed changes to MIL-STD-961C and believe they are substantially better than other proposals seen on this issue. However, they are still not acceptable as-is. The subcommittee offers the following comments:

1. The general contract clause should not be applied to all contracts, but should be reserved for those where semiautomatic or automatic manufacturing and/or inspection is an economically or technically viable alternative.

2. The proposed contract clause should not be needed to authorize the use of Cp and Cpk as acceptance of a process. We already have authorization through MIL-Q-9858A to use "indirect control by monitoring processing methods, equipment and personnel" when qualification and verification of such controls is between the individual contractor and purchaser.

3. The application of Cp and Cpk is only applicable for variables data, and cannot be utilized for visual attributes such as solder joints.

4. Reference to a specific value for Cpk as part of the contract must be removed. Some processes may not meet a Cpk of 1.33, but still be suitable for SPC application instead of AQL/LTPD sampling of finished product. Individual negotiations should be allowed based on a specific contractor's process.

Matt
M. J. Maltagliati
Associate Director
Aerospace Technical Council

MJM/plb

Aerospace Industries Association of America, Inc.
1250 Eye Street NW Washington DC 20005 (202) 371-8400

Aerospace Industries Association

May 16, 1988

Mr. George J. Thielen
Directorate of Systems Engineering
ASD/ENSI
Wright-Patterson AFB, Ohio 45433-6503

Dear George,

We appreciate the opportunity to review your interim report and early output products. Although the attached items are a bit late we sincerely hope they can be given proper consideration.

The multi-service working group approach to implement the new DoD policy on eliminating fixed defect levels and encouraging process control, is an improvement over that outline in the OASD (Production and Logistics) June 16, 1987 Memorandum. This Memorandum would automatically have eliminated AQLs and LTPDs from Section 4.0 revising Quality Assurance in every new or revised specification by revising MIL-STD-961 and MIL-STD-962. AFSC/ENSI's approach seems to be patterned after the US Navy's approach whereby a contract clause would automatically disengage the AQL/LTPD provisions of all specifications and standards. AQL/LTPDs would be zero'ed out and would have to be negotiated on a case by case basis as in the US Navy clause. The vastness of such negotiations would be enormous for a prime contractor or major subcontractor and would involve activity by the Contracting Officer for consideration

Our general and specific comments are outlined in the attachments. In summary, we believe the proposed revisions to clause and specification need to be improved to eliminate barriers to product acceptance which do not add value to the product but may very well add substantial costs. Further, the specifications should not be a substitute for nor conflict with DFAR inspection and acceptance clauses.

Very truly yours,

Malt
M. J. Maltagliati
Associate Director
Aerospace Technical Council

MJM/plb
Attachment

Aerospace Industries Association of America, Inc.
1250 Eye Street, N.W., Washington, DC 20005 (202) 371-8400

Comments on Proposed Contract Clause

General

The proposed contract clause recognizes continuous quality improvement and promotes process control as an alternative to Section 4.0 activities which use AQL and LTPDs. However, there are significant problems with the multi-service working group's approach. These problems are elaborated below:

1. AQL and LTPDs are not necessarily indicative of unacceptable quality, that is, "non-conformances" are not necessarily "defects". The term "defect" should recognize that.

   (a) The man-machine interface is not perfect and contract prices are based on such actuarial data. Therefore, non-conformances" in areas which are not relevant to contract performance in terms of mission need, reliability and maintainability, etc., should be permitted as an advance agreement contained in the AQL and LTPD numerics. Remedying these as defects or controlling these particular kinds of characteristics would appear to be counterproductive and add no value to the product. Erasing these AQL and LTPD thresholds would seem to serve no useful purpose and should not be the basis of non-acceptance or such adjectives such as "consumer" or "producer" risks.

   (b) Many design and producibility provisions in Sections 3 and 5 of Specifications and Standards, now extant, are undoubtedly deficient, conflicting or obsolete. One could have a defect in one technological statement of intent which would not be a defect in a a companion statement within the same document. Improving Section 4 as proposed may worsen rather than help the situation. Zero defects in non-essential characteristics or in conflicting characteristics can be substantially cost driving.

   The proposed contract clause should therefore define the term defect as a non-conformance with a mission critical or essential characteristic.

2. The proposed contract clause should obligate the government with a sampling plan rather than not. The AQL or LTPDs contained in the sampling plan would cause a rejection of the "new" defect but allows acceptance of other non-essential "non-conformances". The latter risk should be allowed in advance and priced accordingly. A separate clause, as was suggested by the multi-service group, appears unnecessary.

3. The proposal clause should be adjusted to make it clear that whether a "sampling plan" or "process control evidence" is set forth in the contract, this negotiated clause from the outset shall be binding on the purchasing activity and not at their unilateral discretion. Changes should be by mutual agreement.

Specific

1. First paragraph -- Line 16, replace "the non-conformances" with "any non-conformances found," to preclude interpretations which would require 100% screening even though the lot is acceptable.

2. Second paragraph, last sentence: Continuous quality improvement is a non-realistic requirement; it suggests continuous tinkering with the process which is undesirable once a satisfactory process is achieved.

Comments on MIL-STD-961C

1. Paragraph 5.3.3X - The sentence "Consistent with potential production quantities, the equipment design shall be compatible with automated or semi-automated manufacturing and inspection processes." appears to dictate automation as a design requirement. This should be made an alternative depending upon the individual program.

2. Paragraph 5.3.3.x - When the government initiates a product specification they usually do not know who will produce the product, and; more importantly by what processes would be used. Therefore, how would the process characteristics and the process capability index (Cp) be determined at this time? These factors would be determined during the transition into production and the initial production runs.

3. Paragraph 5.3.3.x - The sentence "In addition, the design shall be suitable for manufacture by other comparable contractors without comprehensive production engineering changes." is totally unacceptable for two reasons: (1) It is creating a new warranty called "producibility"; and (2) If it were acceptable, it belongs in a contract clause where it is visible for pricing. MIL-STD-961B recognizes this latter aspect in paragraph 4.7 "Contractual and Administrative Requirements".

4. Paragraph 5.3.3.x - The proposed changes to MIL-STD-961C, paragraphs 5.3.3.X Producibility and 5.3.4.X Producibility Verification, would encourage the inclusion of how-to material in specifications. This would be contrary to Acquisition Streamlining, therefore, we recommend against adding those new paragraphs to MIL-STD-961C.

5. Paragraph 5.3.4.2 - As is the case presently the prime contractor is responsible for the overall quality of the product including those items supplied by subcontractor and vendors. Here again, the option of using AQL/LTPDs or SPC for product acceptance should be available as many small suppliers would perhaps not have the knowledgable support staffs to implement a SPC program until their use matures.

6. Paragraph 5.3.4.2 - In the phrase "all contractual requirements" and such identical phrases in 4.1, 4.1.1 and 4.1.2, we have the notion it is practicable to conform to conflicting requirements. Either delete the word "all" or change it to read "all mission essential and/or mission critical contractual requirements", or words to that effect. Further, it is impossible for a contractor to meet all of the requirements when they may include government furnished property or government furnished data, either or which may be defective.

   a. Line 7, delete "is continually reduced," and substitute "is reduced to the extent feasible," inasmuch as continuous reduction is unrealistic.

   b. Line 12, delete "either indicated or actual" since this could be interpreted to require screening inspection.

7. Paragraph 4.1.2 - In the sentence "Except as specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the verification actions required herein, unless disapproved by the Government." Change the last phrase to read: "...unless disapproved by the government under signature of the Contracting Officer." in order to preclude a contractor's opportunity to submit a claim under the Changes Clause for the government involving itself in a contractor's how-to.

8. Also paragraph 5.3.4.2 and paragraph 4.2.2 therein, the last sentence should be deleted or adjusted to be an informational statement since it is contract clause material. Paragraph 4.7 of MIL-STD-961B is clear on this point as well.

9. Paragraph 5.3.4.X - There is a question of how "important product and process characteristics" can be determined at the time the procuring agency is preparing the product specification. These characteristics and performance capability index would have to be determined during the transition to production and then continual improvement planned during the production phase.

10. Paragraph 5.3.4.14 - In paragraph 4.6 therein, the sentence which reads "The decision to accept the process control evidence as a suitable alternative to other examinations or tests will be at the discression of the Purchasing Activity." to read: "... will be at the direction of the Purchasing Activity as expressed in a Contract or Purchase Order or under signature of the Contracting Officer in the event such a Contract or Purchase Order has already been executed." The reasons are the same as (7) above.

11. Paragraph 5.3.4.14 - Last sentence before the example: "...acceptable to the government purchaser or cognizant government representative" is highly ambiguous, since there is often interagency conflict in such matters of subjective acceptability.

12. Paragraph 5.3.4.14 - 4.6 - In the example, third last line: Delete "observed commitment to continuous quality improvement" for the reason cited above.

13. The issue of NDI and off-the-shelf equipment is not addressed in the multi-service group approach. Neither is the statutory preference for commercial equipment recognized. These equipments come from a different environment of "AQLs and LTPDs" and should be accepted separately in the overall commercial acquisition process. The proposed contract clause and MIL-STD-961C Draft Revision should recognize this area preferably by deliberate exclusion with deference to a contract line item on this matter.

AD HOC WORKING GROUP

Elimination of AQLs/LTPDs from Federal Specifications

FINAL REPORT

G. J. THIELEN
13 JULY 1988

OUTLINE

- ✓ BACKGROUND AND SYNOPSIS OF CHARTER
- ✓ WORKING GROUP PARTICIPANTS
- ✓ ACTIVITIES
- ✓ RELATED EFFORTS
- ✓ TUTORIAL: KEY CONCEPTS
- ✓ OUTLINE OF "PRODUCTS"
- ✓ CONCLUSIONS
- ✓ RECOMMENDATIONS

THE DOD PRODUCT QUALITY OBJECTIVE

SHIFT FROM END-OF-LINE INSPECTION AND
TESTING TO ...
MANUFACTURING AND PROCESS CONTROL
as a primary means of achieving
PRODUCT QUALITY IMPROVEMENT

Dr Costello ...

business climate: know suppliers and their capability
avoid QA requirements that
"guard against the unknown"

action: eliminate AQLs/LTPDs from Federal specifications

AD HOC WORKING GROUP

removing AQLs/LTPDs from Federal specifications

"CHARTER"

- PROPOSE WORKING-GROUP APPROACH IN MEMO TO OASD
- IDENTIFY ALL THE ISSUES
- PORTRAY RANGE OF POTENTIAL RESPONSES, RECOMMEND
- DRAFT REVISION TO MIL-STD-961 ...
  - SPC vs ACCEPTANCE INSPECTION/TEST/SAMPLING
  - EXAMPLES OF SPECIFICATION LANGUAGE
  - OTHER, AS APPROPRIATE
- SUGGEST CONTRACT LANGUAGE
- INTERIM GUIDANCE POLICY LETTER TO SERVICE DEPSOs

KEY ACTIVITIES

- Pentagon organizational meetings....................7,14 JAN
- Working group members identified....................22 JAN
- Memorandum to OASD signed out (our charter)....................29 FEB
- Working group meetings....................3 MAR
- ....23 MAR
- ....21 APR
- Participate in Govt-Industry meeting on alternatives to 100% inspection....................30 MAR
- Participate in meeting on draft DOD SPC handbook....................31 MAR
- Interim report (charts)....................7 APR
- Inform industry of recommendations....................11 APR
- Briefed OSD Standardization Panel....................4 MAY
- Briefed Defense Standardization Council....................10 MAY
- Drafted guidance letter to services....................1 JUN
- Briefed and submitted final report....................13 JUL

WORKING GROUP PARTICIPANTS

* MEMBERS

Atkinson, Don*	DLA-QL
Berg, John	AFLC/PMMQ
Bradley, Ryan and Garner, Cal*	SAF/AQCM
Harris, Fred*	DLA-SE
Hopkins, George and Lash, Jim*	AMCPD-SE
Huber, Deidre	GSA/FSS
Kessler, Eric*	OASN(S&L)/RM&QA
Kopala, Major Jean*	SAF/AQXA
Mathenia, Jim and Major Daugherty*	HQ AFSC/PLEQ
Pap, Geza M.*	AMSMC-QAH
Payne, Keith	ASD/EN(PA)
Schmitt, Bob	DLA-Q
Cook, Bob	AMCQA-E
Steele, Lt Col Jack*	HQ AFLC/QA
Thielen, George J.*	ASD/ENSI

RELATED EFFORTS

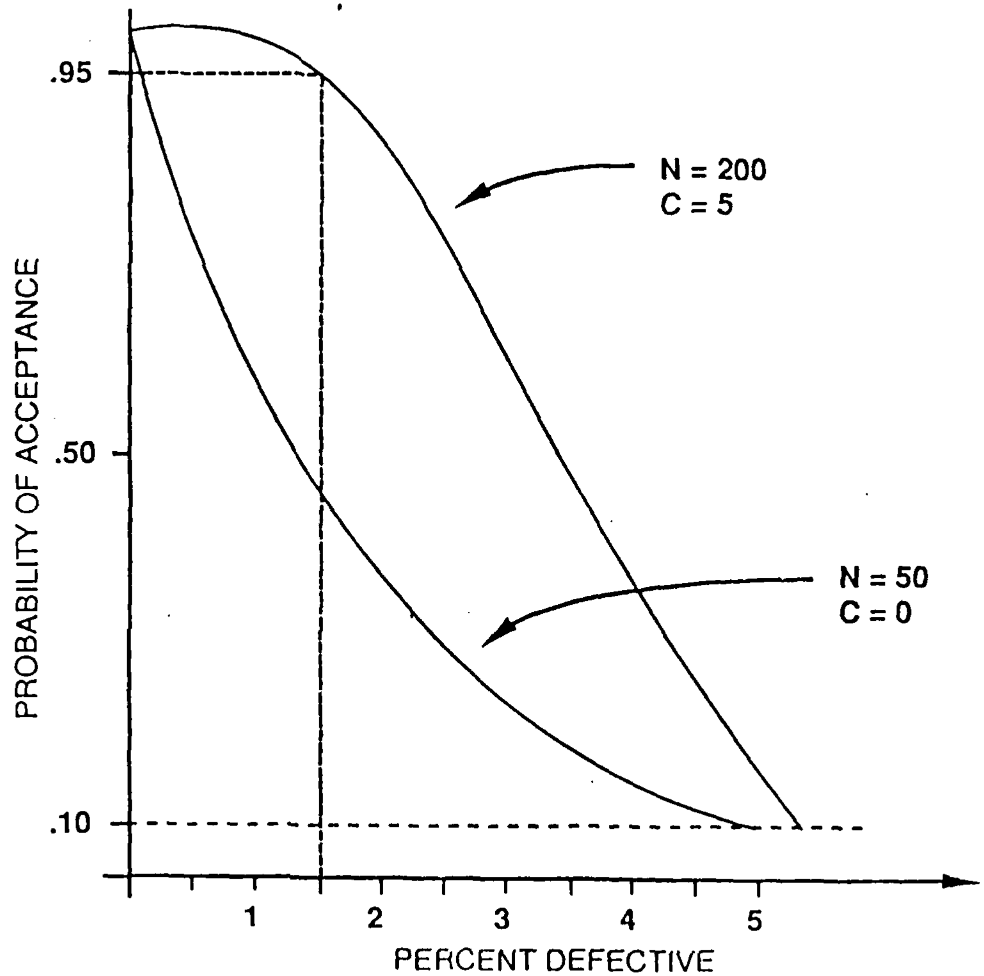
- ✓ DESC PPM PROGRAM
- ✓ EIA SPC STANDARDS DEVELOPMENT
- ✓ INDUSTRY-GOVT WORKING GROUPS ON ALTERNATIVES TO 100% INSPECTION
- ✓ PREPARATION OF DOD SPC HANDBOOK
- ✓ REVISION OF MIL-STD-105
- ✓ SPC FAR CLAUSE, ARMY
- ✓ AQL/LTPD CLAUSE, NAVY

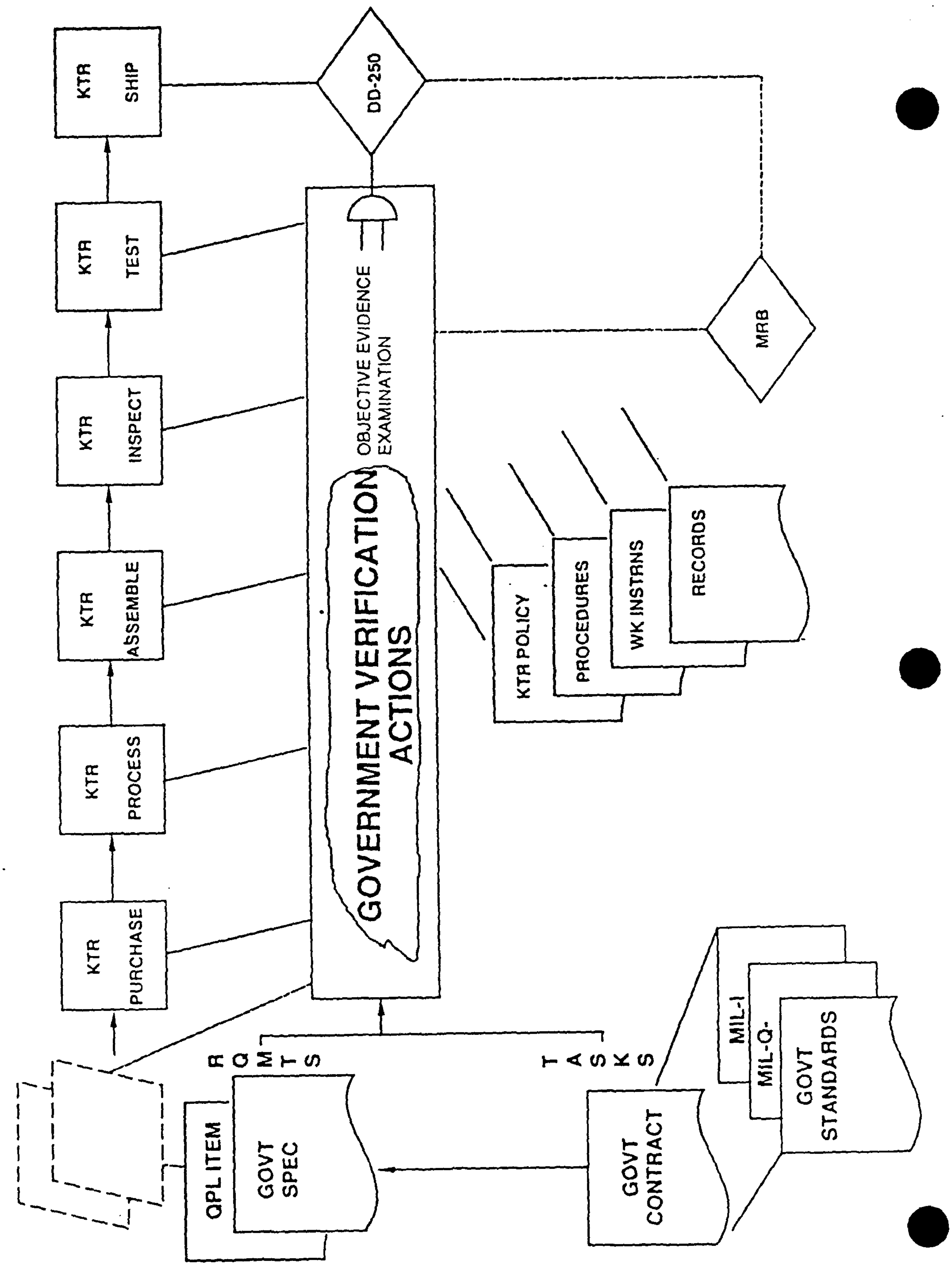
TUTORIAL: CONCEPTS

- ✓ SAMPLING: WHAT'S AN AQL?
- ✓ CONTRACT/SPECIFICATION REQUIREMENTS - CONTRACTOR & GOVERNMENT ROLES
- ✓ QUANTIFY PROCESS CONTROL ATTAINMENT AND CONTINUOUS QUALITY IMPROVEMENT

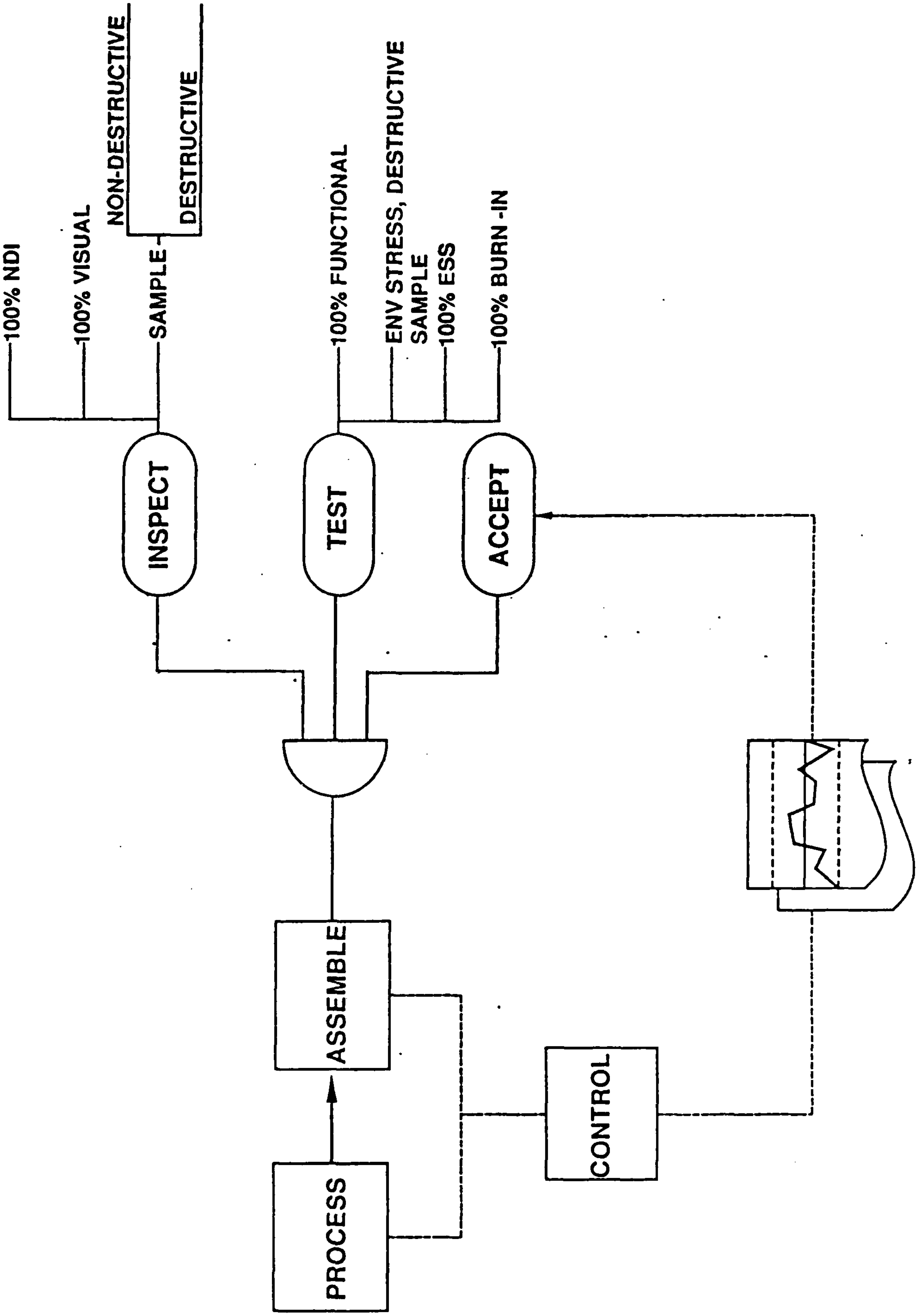
ILLUSTRATION OF AQL/LTPD TERMS:

- ✓ QUANTIFY RISK INHERENT IN ALL SAMPLING
- ✓ AQL: PRODUCER RISK ~ 5% WHEN PROCESS QUALITY EQUALS AQL
- ✓ LTPD: QUALITY LEVEL AT WHICH ~ 10% OF LOTS ARE ACCEPTED
- ✓ OC CURVES:



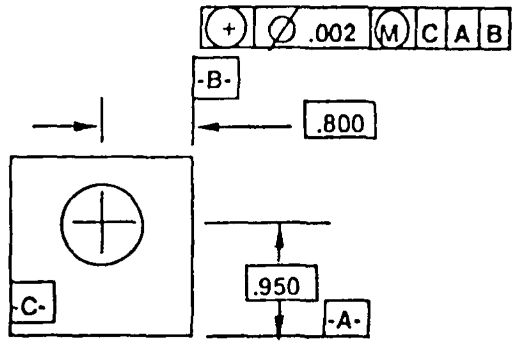


KTR PURCHASE
KTR PROCESS
KTR ASSEMBLE
KTR INSPECT
KTR TEST
KTR SHIP
DD-250
GOVERNMENT VERIFICATION ACTIONS
OBJECTIVE EVIDENCE EXAMINATION
MRB
KTR POLICY
PROCEDURES
WK INSTRNS
RECORDS
QPL ITEM
GOVT SPEC
RQMTS
TASKS
GOVT CONTRACT
MIL-I
MIL-Q-
GOVT STANDARDS



PROCESS
ASSEMBLE
CONTROL
INSPECT
TEST
ACCEPT
100% NDI
100% VISUAL
SAMPLE
NON-DESTRUCTIVE
DESTRUCTIVE
100% FUNCTIONAL
ENV STRESS, DESTRUCTIVE
SAMPLE
100% ESS
100% BURN -IN

ENGINEERING DRAWING



SPECIFICATION

1.

2.

3. DESIGN/BUILD RQMTS

4. VERIFICATIONS

- CONTRACTOR RESPONSIBILITY
- QUALIFICATION
- ACCEPTANCE

  -- EXAMINATIONS
    --- 100%
    --- SAMPLING
  -- TESTS
    --- 100%
    --- SAMPLING

- PROCESS CONTROL

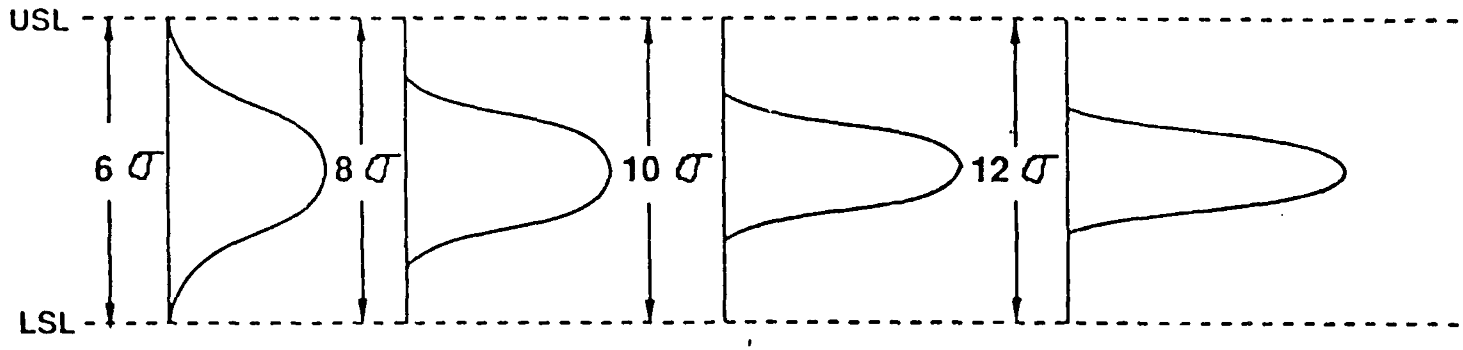
5.

6.

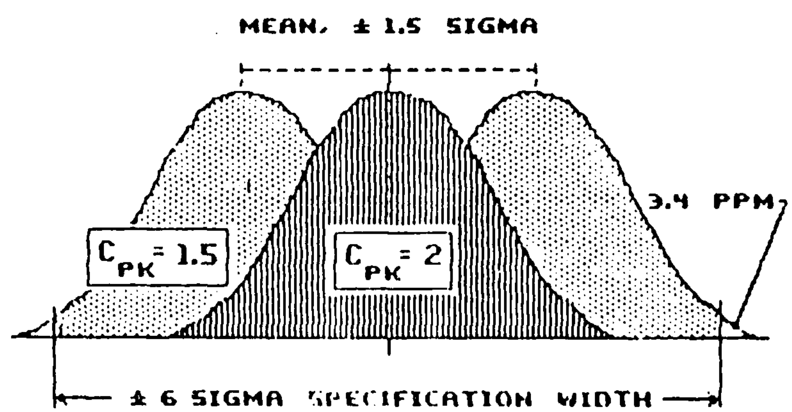
IMPORTANT CHARACTERISTICS

ADDED

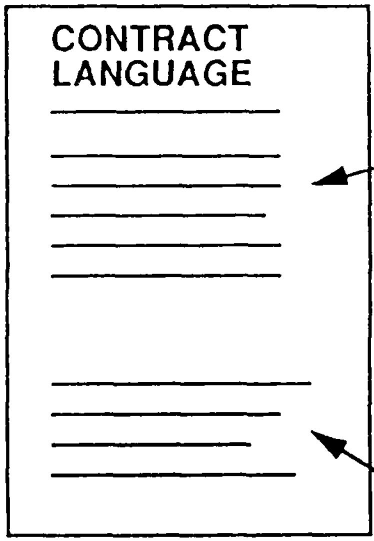
percent of spec	100	75	60	50
Cp	1.00	1.33	1.66	2.00
fraction non-conf.	2700 ppm	64 ppm	0.6 ppm	~ 0.1 ppm



SIX-SIGMA CAPABILITY



OUTLINE OF PRODUCTS: I



- NEUTRALIZES AQL/LTPD CONFUSION
- SPEC AQL/LTPD NON BINDING
- SAMPLING RISK SEPERATELY NEGOTIATED

- OFFERS LOWER COST ALTERNATIVE
- EVIDENCE OF CONTROLLED MFG PROCESSES
- PURCHASING ACTIVITY DISCRETION
- CONSIDERATIONS
  - PRODUCT QUALITY RECORD
  - COMMITTMENT TO CQI
  - QUALITY SYSTEM COMPLIANCE

OUTLINE OF PRODUCTS: II

MIL-STD-961C

SPECIFICATION FORMAT

1. SCOPE
2. APPL. DOCUMENTS
3. REQUIREMENTS
4. QA PROVISIONS
5. PACKAGING
6. INFO/GUIDANCE

- ADDED PRODUCIBILITY REQUIREMENT, Cp
- CHANGE TITLE TO "VERIFICATION PROVISIONS"
- CLARIFY MANUFACTURER RESPONSIBILITY FOR CONTROL OF PRODUCT QUALITY
  - "CONTROL VARIATION . . ."
- ADDED PRODUCIBILITY VERIFICATION
- ADDED PROCESS CONTROL VERIFICATION
  - OBJECTIVE EVIDENCE OF CONTROLLED MANUFACTURING PROCESSES
  - Cpk AT LEAST 1.33, 64 ppm

A LOWER-COST ALTERNATIVE TO END-OF-LINE SAMPLING, INSPECTION OR TEST

GUIDANCE ON SAMPLING

- MAY BE USED BY MANUFACTURERS TO ASCERTAIN CONFORMANCE
  - -- IN-LINE QC
  - -- END-OF-LINE QC
- MAY BE USED BY GOVERMENT TO VERIFY CONFORMANCE
  - -- IN-LINE VERIFICATION
  - -- END-OF-LINE VERIFICATIONS
- SPECIFIC SAMPLING PLANS MAY BE SPECIFIED (IN SEC 4) FOR USE BY MANUFACTURERS IN CONFORMANCE VERIFICATION. (E.G. TESTS WHICH ARE DESTRUCTIVE OR LIFE-LIMITING)
- SPECIFIC SAMPLING PLANS SHALL NOT BE SPECIFIED (IN SEC 4) TO LIMIT GOVERMENT VERIFICATION OR OBLIGATE THE GOVERMENT TO ACCEPTANCE OF FIXED DEFECT LEVELS.
- THE USE OF "ACCEPT-ON-ZERO" SAMPLING PLANS IS ENCOURAGED WHEN PRODUCIBLE DESIGNS AND CONTROLLED PROCESSES SUPPORT EXPECTATION OF NON-CONFORMANCE RATES BELOW 1000PPM.
- VARIABLES DATA ALSO USEFUL FOR VERIFYING NONCONFORMANCE LEVELS IN PPM RANGE

CONCLUSIONS:

- ✓ RECOGNIZE CONTINUED USEFULNESS OF SAMPLING TECHNIQUES
- ✓ INCREASED PROCESS CONTROL EMPHASIS LEADS TO A LOWER-COST, HIGHER-QUALITY ALTERNATIVE TO END-OF-LINE SAMPLING, INSPECTION, TEST
- ✓ SUPPORTING TECHNOLOGY EXISTS
- ✓ PROCESS CONTROL, INCLUDING SPC, IS NOT AN ACCEPTANCE PROCEDURE
- ✓ EVIDENCE OF CONTROLLED PROCESSES, TOGETHER WITH COMPLIANCE WITH OTHER QUALITY SYSTEM REQUIREMENTS (& TQMS) IS AN ACCEPTANCE CONSIDERATION.

  HENCE THE *PROCESS CONTROL VERIFICATION* PROVISION SHOULD BE ADDED TO MIL-STD-961.

- ✓ PREREQUISITES (SEE NEXT PAGE)

CONCLUSIONS: (CONT'D)

✓ PREREQUISITES

- IDENTIFICATION OF IMPORTANT PRODUCT/PROCESS CHARACTERISTICS
- PRODUCIBLE DESIGNS (TOLERANCES COMPATIBLE WITH PROCESS CAPABILITY)
- QUALIFIED, CONTROLLED MANUFACTURING PROCESSES
- AGREEMENT BETWEEN BUYER & SELLER ON NECESSARY TECHNICAL DATA
- TECHNICALLY-QUALIFIED PURCHASING PERSONNEL
- ADEQUATE TECHNICAL GUIDANCE (SPECS, STANDARDS, HANDBOOKS, CLAUSES)

RECOMMENDATIONS:

STEP	IMPACT	SCOPE	ACTION
1.	IMMEDIATE	UNIVERSAL	CONTRACT LANGUAGE ON SAMPLING RISK. ALL NEW CONTRACTS & CONTRACT MODS TO INCLUDE RECOMMENDED SPECIAL PROVISION
2.	NEAR-TERM	BROAD	CONTRACT LANGUAGE ESTABLISHING IN-LINE PROCESS CONTROL EVIDENCE AS AN ACCEPTANCE ALTERNATIVE TO END OF LINE INSPECTION
3.	NEAR-TERM	SELECT	CONTRACT LANGUAGE DIRECTING SPC OR OTHER SPECIFIC APPLICATIONS OF QUALITY TECHNOLOGY OR QUALITY ENGINEERING EFFORT
4.	LASTING	BROAD	MIL-STD-961C CHANGES TO SEC 3&4 FORMAT FOR GOVT SPECIFICATION PREPARERS (ENGINEERS) TO ADDRESS -- DESIGN CONSIDERATION OF MFG CAPABILITY -- QUALIFICATION OF PROCESSES -- IDENTIFICATION OF IMPORTANT CHARACTERISTICS -- CONTRACTOR CONTROL OF MFG VARIABILITY -- ALTERNATE BASIS FOR VERIFICATION AND ACCEPTANCE

TQM

TOTAL QUALITY MANAGEMENT

TOTAL QUALITY MANAGEMENT

TOTAL QUALITY MANAGEMENT

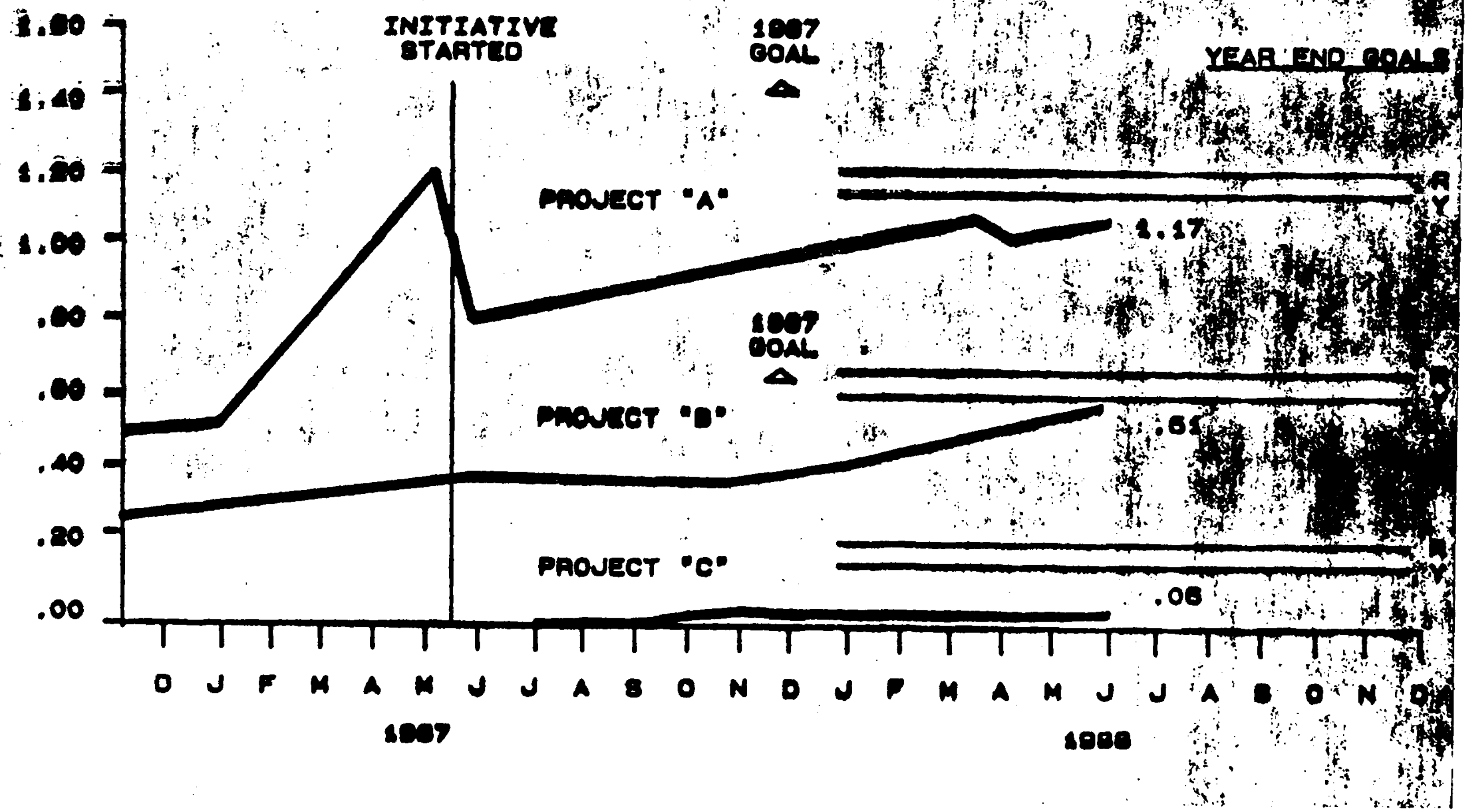
TOTAL QUALITY MANAGEMENT

- QUALITY IS A MANAGEMENT ISSUE
  - REQUIREMENTS
  - DESIGN
  - MANUFACTURING
  - OPERATIONS & SUPPORT
- NEED FOR AN INTEGRATED STRATEGY
- IMPLEMENTATION OF PROCESS CONTROLS AND CONTINUOUS PROCESS IMPROVEMENT
- CHANGE FOCUS FROM DETECTION TO PREVENTION

ENGINEERING EXCELLENCE INITIATIVE

PURPOSE	-	TO IMPROVE THE FIRST-TIME QUALITY OF ENGINEERING PRODUCTS FOR PRODUCIBILITY AND PRODUCTIVITY
GOAL	-	TO BRING ABOUT A TENFOLD IMPROVEMENT IN THE FIRST-TIME QUALITY OF ALL ENGINEERING PRODUCTS BY THE END OF 1989
APPROACH	-	ACTIVATE "DESIGN EXCELLENCE TEAM" TABLETOP REVIEWS OF DRAWINGS READY FOR RELEASE; MEASURE FINDINGS
	-	SELECT IMPORTANT MEASUREMENT AND SET SPECIFIC GOALS
	-	PROMOTE MOTIVATIONAL EVENTS AND INDIVIDUAL AWARDS
RESULTS	-	1987 GOALS (SET IN MAY 1987) WERE FULLY ACHIEVED
	-	NEW ENGINEERING DRAWINGS DEMONSTRATING FACTOR OF (4) FOUR IMPROVEMENT OVER PRIOR EXPERIENCE
	-	ATMOSPHERE OF IMPROVEMENT AND ACCOUNTABILITY IS SPREADING IN MANAGEMENT, SUPERVISION AND WORKING LEVELS

NUMBER OF LIAISON CALLS GENERATING CHANGES
PER SHEET OF INITIAL RELEASE
(CUMULATIVE RATIO)
3 MAJOR PROJECTS



- PROJECT "A" REPRESENTS A PROGRAM WELL UNDERWAY PRIOR TO THE START OF THE ENGINEERING EXCELLENCE INITIATIVE.
- PROJECT "B" REPRESENTS A BETTER OPPORTUNITY TO APPLY THE INITIATIVE EARLIER WITH IMPROVED RESULTS.
- PROJECT "C" REPRESENTS IMPROVED RESULTS AND REFLECTS LESSONS LEARNED AND APPLIED.

PROJEC11

TABLETOP DRAWING DATA - DS

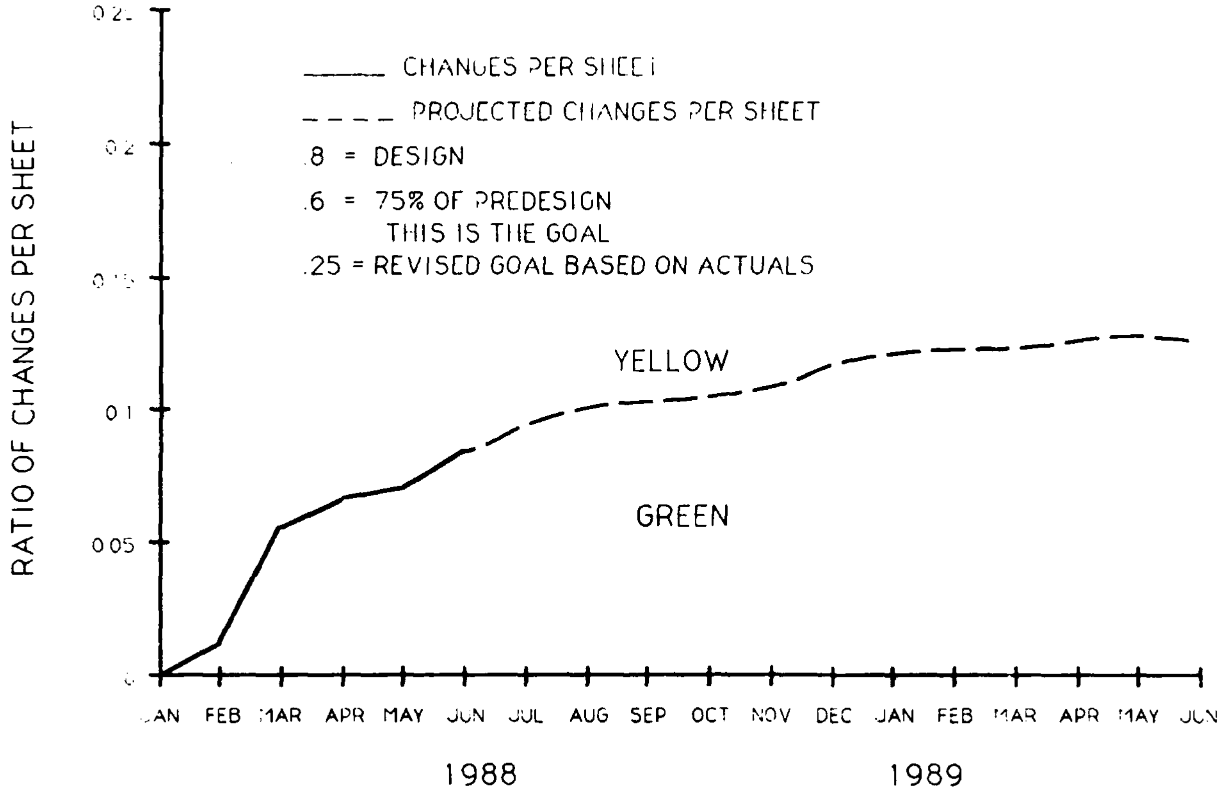
7/7/88

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
MONTHLY:								
DRAWING SHEETS	21	18	14	57	50	58	53	145
REVIEW ITEMS								
M	9	9	4	3	9	7	3	4
L	30	24	19	49	21	10	10	10
S	20	19	10	41	22	21	22	4
C	0	0	5	15	18	18	17	5
CUMULATIVE:								
DRAWING SHEETS	97	115	129	186	236	294	347	492
REVIEW ITEMS								
M	10	19	24	27	36	43	46	50
L	52	76	95	144	165	175	185	195
S	30	49	59	100	122	143	165	169
C	0	0	5	20	38	56	73	78

LEGEND

M - PRODUCIBILITY
L - WOULD RESULT IN LIAISON CALL TO CHANGE DRAWING
S - SUGGESTION INVOLVING DRAWING CLARIFICATION AND/OR IMPROVEMENT
C - REQUIREMENTS CHANGE AND/OR LATE ANALYTICAL INPUT

NUMBER OF LIAISON CALLS GENERATING CHANGES
PER SHEET OF INITIAL RELEASE (CUMULATIVE)



ENGRNG SHEETS	188	225	267	297	365	397
L/Cs GEN CHGS	0	3	15	20	26	34
CHGS/SHEET	.0	.013	.056	.067	071	.085

STATISTICAL PROCESS CONTROL INSTALLATION PHASING:

PHASE I - DATA COLLECTORS, MICROPROCESSORS AND STANDARD GAGES (1988)

PHASE II - DATA COLLECTORS, MICROPROCESSORS, PROGRAM DEDICATED GAGES & NETWORKING OF SYSTEM (1989)

PHASE III - MACHINE INTERFACE AND CLOSED LOOP SYSTEM FOR AUTOMATIC FEEDBACK FOR TOOL COMPENSATION (1990)

SPC

PHASE I IMPLEMENTATION PLAN

- STATIONS CONSIDERED FOR SPC WILL BE EVALUATED FOR:
  - CAPABILITY - ATTRIBUTES AND VARIABLES ANALYSIS OF THE MACHINE AND PROCESS.
  - DEFECT HISTORY - PARETO REPORTS, ETC.
    - MARS
    - SCRAP
    - REWORK
    - QDR's
  - FEASIBILITY - PAYBACK
    - QUALITY IMPROVEMENTS
    - COST REDUCTIONS
      -TOUCH LABOR - MFG & INSPECTION
      -SUPPORT - P.E., Q.E. & P.C.
  - DESIGN PLAN
- MANAGEMENT REVIEW OF EACH STATION BEFORE FUNDS COMMITTED

Maximum
Quality
Thru
SPC

MARTIN MARIETTA MISSILE SYSTEMS

SPC PHASE I

EXPECTED PAYBACK STATION #1

(BASED ON EXPECTED REDUCTIONS OF 75%)

MAZAK LATHE IN THE NON-METALLICS CENTER

	1987 ACTUALS	EXPECTED SAVINGS
SCRAP	$22,099	$16,574
REWORK	6,519	4,889
MARS TAGS	17,667	13,250
SUBTOTAL	$46,285	$34,713
INSPECTION, TOUCH, OTHER		TBD
EXPECTED COST SUCCESS PAYBACK		$34,713+

SPCPB1

Maximum
Quality
Thru
SPC

MARTIN MARIETTA MISSILE SYSTEMS

SPC PHASE I

EXPECTED PAYBACK STATION #2

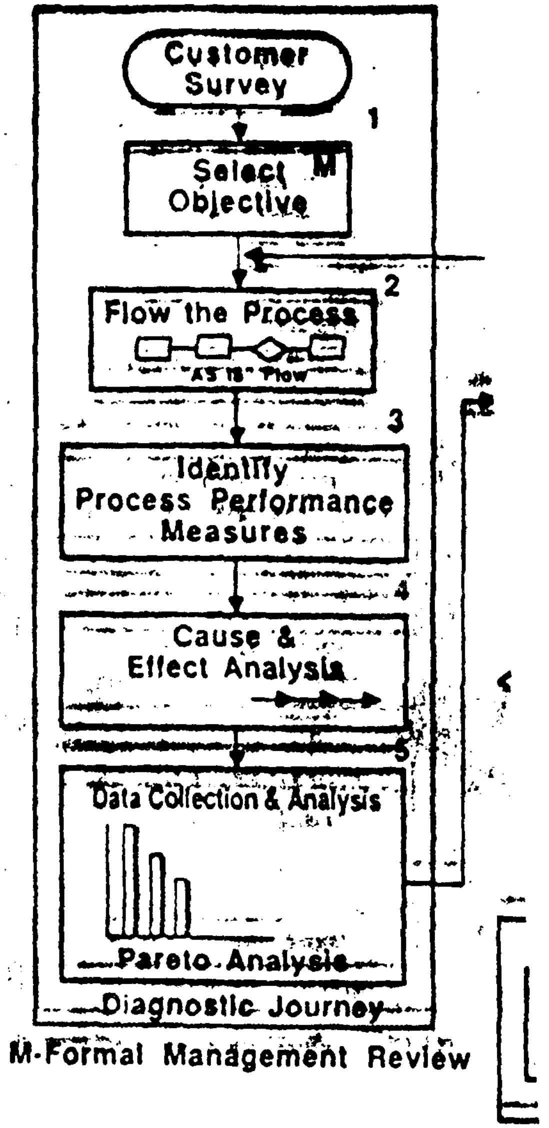
(BASED ON EXPECTED REDUCTIONS OF 75%)

K&T 1015 MACHINING CENTER IN THE NON-METALLICS CENTER

	1987 ACTUALS	EXPECTED SAVINGS
SCRAP	$20,352	$15,264
REWORK	3,997	2,997
MARS TAGS	18,120	13,590
SUBTOTAL	$42,469	$31,851
INSPECTION, TOUCH, OTHER		TBD
EXPECTED COST SUCCESS PAYBACK		$31,851+

SPCPB2

PROCESS SIMPLIFICATION MODEL



M-Formal Management Review

Project
Challenge

P/S TEAMS

STATUS CHART

JUL. 07, 1988

STATUS DATE: 7/7/88

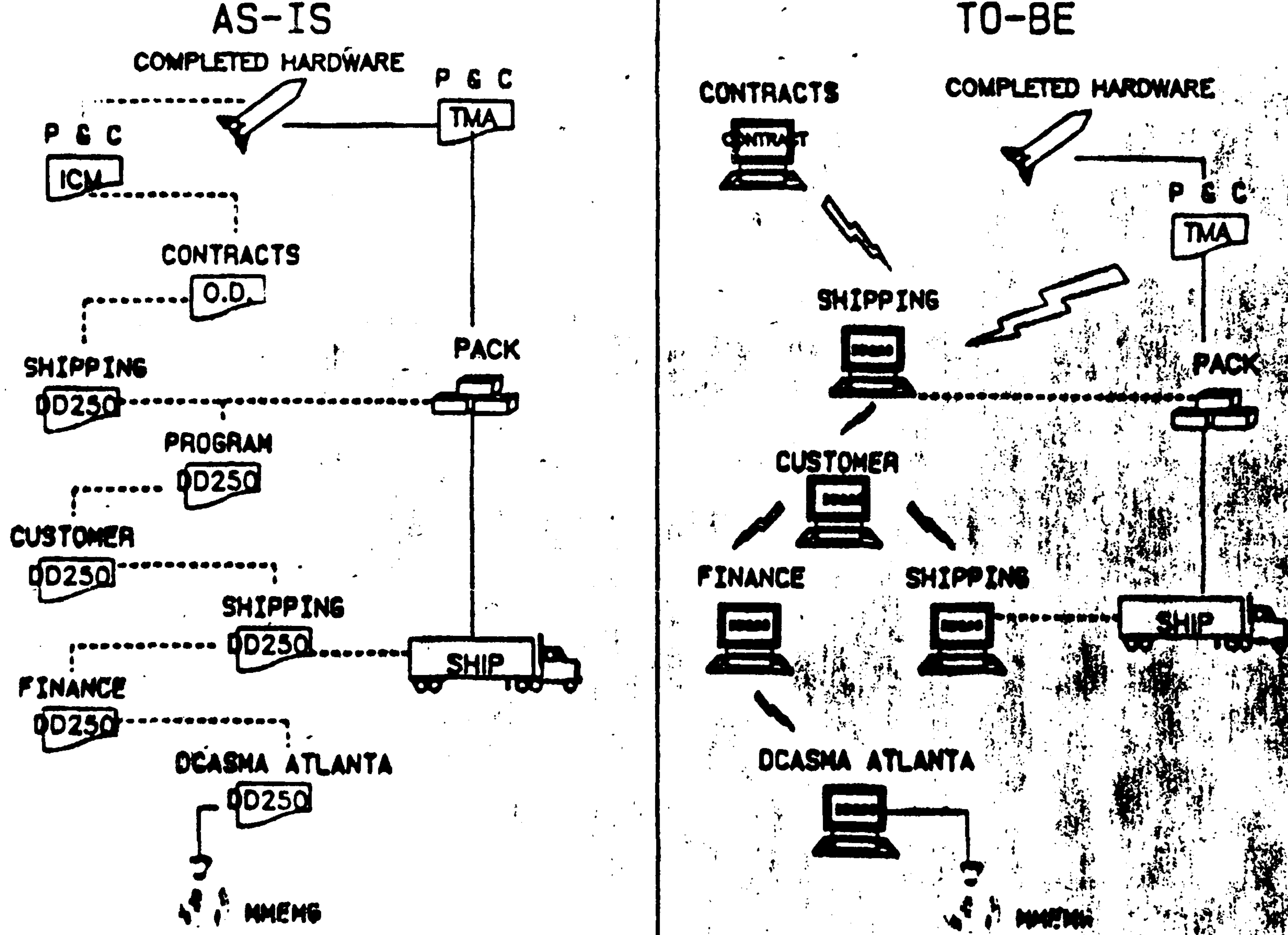
NO.	SUBJECT	RESP.	PROMISED COMPLETE	STEP NO.	G	Y	R	ACTUAL/REMARKS
1	MRB TEAM REWORK IN PMR/MRB	AUSTIN	NOV AUG	4 6				MAJOR QUALITY INVOLV
2	REPLACEMENT PARTS SYSTEM ELECT. VOUCHER SUBTASK	COWAN	NOV SEPT	3 7				
3	DEVELOPMENT CYCLE SPAN TIME	HARDING	TBD	3				
4	RECEIVING/INSP VENDOR REWORK SUBTASK	BARGMANN	THRU 88 JULY	3 6				
5	AS/RS MULTI KITTING SUBTASK	COX	SEPT JULY 7	3 8				COMPLETED INSTALL.
6	WAREHOUSING FACILITIES MAINTENANCE LEASES	WINFIELD	DEC OCT	5 7				
7	SHIPPING ELECT. DD250 SUBTASK	WHEATLEY	DEC OCT	2 5				
8	SOT PACKAGE	SMILGIN	OCT	4				QUALITY INVOLVEMENT
9	COMPUTER GENERATED REPORTS MOTION COSTS SUBTASK	MARGESON	AUG JULY	4 6				

G - GREEN - ON OR AHEAD OF SCHEDULE
Y - YELLOW - 1 OR 2 WEEKS BEHIND SCHEDULE
R - RED - 3 OR MORE WEEKS BEHIND SCHEDULE
STEP NO - STATUS AGAINST P/S STEP NUMBER OF 10 STEP PROCESS

CONTACT: D. McDANIEL

ACTION20

DD-250 PROCESS



AVERAGE TIME 2 TO 4 WEEKS | QUICK / ERROR FREE

$50K PER DAY: TIME VALUE OF MONEY

PROCESS SIMPLIFICATION

PROCESS NO.	PROCESS/OBJECTIVE	ACTION TAKEN	VERIFIED SAVINGS	OWNER TEAM
509 (Cont)		in manmonths but also by the fact that the total number of nonconformance MARS written in the Emplacer MOD Program has been significantly reduced (i.e., The RISS for CI-4 had 81 total items entered on the RISS. Only 6 of these items required an actual GPP MARS)		
459	Review Rocket Research Rocket Engine Module (REM)	1. Remove In-Process Verification and enhance final acceptance. 2. All In-Process mandatory inspection points were removed. Final acceptance inspection provide the required checks and balances.	$ 42,300	J. Carroll G. Cleveland R. Pressburg A. Kondrotis
656	Implement Purchase Order coding on program rather than central QA procurement.	1. Train project personnel to code P.O. thereby reducing coordination time with central. 2. All P.O. coding is now accomplished by each program. Each program has trained a minimum of one individual to accomplish P.O. coding responsibilities.	$ 42,700 Peacekeeper $ 32, 250 SICBM	J. Carroll J. Nelson R. Pressburg D. Wilkerson T. Kondrotis

PROCESS SIMPLIFICATION

PROCESS NO.	PROCESS/OBJECTIVE	ACTION TAKEN	VERIFIED SAVINGS	OWNER TEAM
669	Simplify data collection and B/W characteristic verification for all Missile Handling Equipment/ Small Missile Test Launcher.	1. <u>Develop supplier data requirements (improved format)</u> Provide all vendors with a standardized format for completion of acceptance data. Additionally, approved vendor data formats and provided assistance to vendors in implementing supplier data requirements. SDRL's have been revised to effect an average of 8.0 hours savings per shipment.	$26,250 SICBM	J. Carroll J. Morton R. Pressburg T. Kondrotis
670	Provide Quality Configuration Status Review Concurrent with Change Design for Missile Handling Equipment/Test Launcher	1. Provide job sheet verification during design review and delete PEPC requirements.	$22,500 SICBM	J. Carroll J. Morton R. Pressburg T. Kondrotis
	Verification during Design Review	2. This item has been implemented throughout the entire MHE/TL program.		
692	Logs and documentation at DPF for PBV/Shroud assembly.	1. Combine process operations at DPF thereby reducing the number of Logs and MPP's. 2. PBV/Shroud Logs for the first three vehicles were reviewed and evaluated to determine if process plans could be combined. As a	$34,500 SICBM	J. Carroll A. Ardrey R. Pressburg T. Kondrotis

PROCESS SIMPLIFICATION

PROCESS NO.	PROCESS/OBJECTIVE	ACTION TAKEN	VERIFIED SAVINGS	OWNER TEAM
692 (Cont)		result of the evaluation PBV/ Shroud process plans were reduced by 25%.		
701	IFSS and SE Production Efforts in EMF	1. Improve IFSS and SE production efforts in EMF both, from a cost savings in the reduction of SRR. - Assign DD250 effort to Project Quality - Reduce PQVR's. - Implement SPC of the flow soldering process. - Align STP MP with MIL-STD-454 requirements. - Delete in-line inspection for PCB test. (Accomplished as data review).	$315,000 Peacekeeper	J. Carroll A. Ardrey R. Pressburg R. Wilkerson
819	Combine Logistics Quality Software and Configuration Quality into Existing Function	1. Existing Program Integration, and Logistics Quality consolidated into existing Project Quality function. 2. The existing functions of Program Integration, and Logistics Quality into the existing Project Quality functions has been simplified by combining skills and multiplying the disciplines in which assigned personnel will perform responsibilities. This has been accomplished with no reduction in checks and balances in any of the integrated areas.	$465,000 Peacekeeper	J. Carroll D. Boyle R. Preessburg R. Wilkerson

PROCESS SIMPLIFICATION

PROCESS NO.	PROCESS/OBJECTIVE	ACTION TAKEN	VERIFIED SAVINGS	OWNER TEAM
822	Review of Process Plans between DPF and DSC	1. Automate the review of Process Plans between DPF and DSC. 2. Utilizing the IBM PC with a Modem has allowed real time processing of plans between the DPF and DSC. This has eliminated all handcarrying of data and has enhanced the overall review of process plans.	$15,750 SICBM	J. Carroll A. Ardrey R. Pressburg T. Kondrotis
823	Source Quality at Major Suppliers. Reduce source quality at major suppliers of IRSS components.	1. Mandatory inspection points have been reduced at all major subcontractors, thereby reducing source quality involvement. Reduction of MIPS permits better utilization of personnel without eliminating requiring checks and balances.	$52,500 SICBM	J. Carroll J. Nelson R. Pressburg A. Kondrotis

PERFORMANCE

MEASUREMENT

TEAMS

PERFORMANCE MEASUREMENT TEAM (PMT) BACKGROUND AND EVOLUTION

- COMMITMENT TO EXCELLENCE (CTE) PROGRAM - - SEPT 1983 - MAY 1986
  - TARGETED TOWARD SENIOR/MIDDLE MANAGEMENT
  - MAJOR THRUSTS:
    - ESTABLISH PRODUCT QUALITY AS #1 PRIORITY
    - CHANGE MANAGEMENT CULTURE
  - MANAGEMENT PARTICIPATED IN CTE WORKSHOPS
  - LACKED SYSTEM FOR INDIVIDUAL PERFORMANCE MEASUREMENT/FEEDBACK
  - MINIMAL INVOLVEMENT OF PRODUCTION WORK FORCE/TOUCH LABOR GROUPS

PERFORMANCE MEASUREMENT TEAM (PMT) PROGRAM

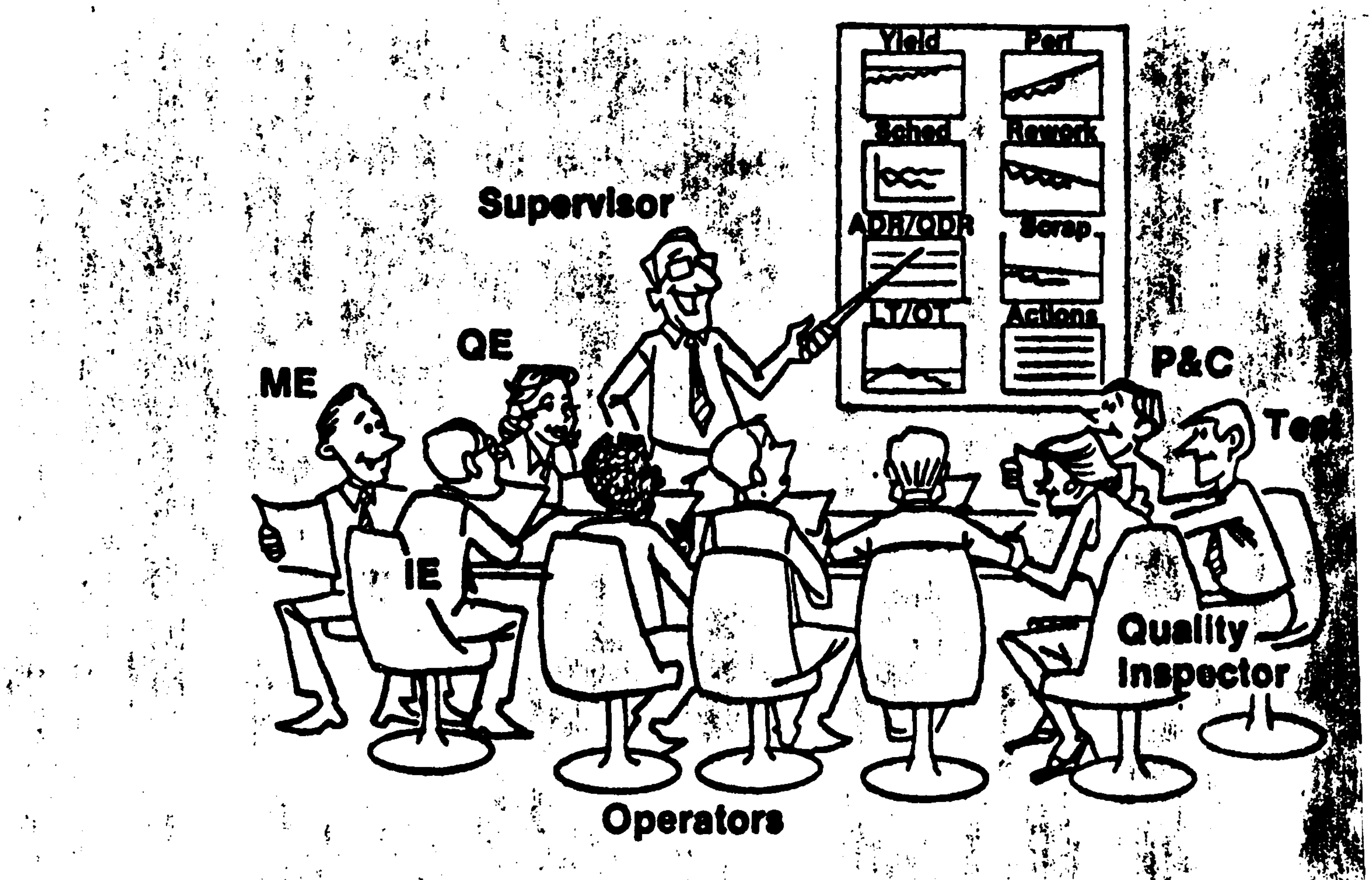
PURPOSE:

- ESTABLISH OWNERSHIP/RESPONSIBILITY/ACCOUNTABLITY AT 1ST LINE SUPERVISOR LEVEL
- PROVIDE SUPERVISORS WITH NECESSARY MANAGEMENT TOOLS/DATA
- DEFINE WORK GROUP REQUIREMENTS AND ESTABLISH GOALS TO MEET REQUIREMENTS
- PROVIDE REAL TIME PERFORMANCE DATA AT WORK GROUP LEVEL

- YIELDS (INSPECTION/TEST)	- SCRAP
- COST	- MRB/NON-MRB
- SCHEDULE	- ADRs/QDRs
- REWORK	- ACTION ITEMS

- DEVELOP INFORMED/RESPONSIVE PRODUCTION TEAMS
- LEARN EFFECTIVE PROBLEM SOLVING TECHNIQUES

Competitiveness Through Teamwork
Performance Measurement Teams



Performance Measurement Teams (PMTs) are a cooperative effort to bring employees involved with manufacturing processes together to talk about ways to improve our products and to solve problems. For one hour each week, 118 PMTs meet to promote group participation, increase productivity, and keep Martin Marietta in a competitive position within the constantly changing aerospace industry.

PRODUCTION OPERATIONS PERFORMANCE MEASUREMENT SYSTEM

WHAT IS MEASURED:

- HARDWARE YIELD (INSPECTION/TEST)
- SCRAP
- REWORK
- MRB/ADR/QDR
- COST PERFORMANCE
- SCHEDULE PERFORMANCE
- LOST TIME/OVERTIME
- ACTION ITEMS

PERFORMANCE MEASUREMENT CHARTS

PRODUCT QUALITY	• INITIAL YIELD	(INSPECTION & TEST)
	• REWORK	(MFG CAUSED)
	• SCRAP	(MFG CAUSED)
	• ADR/QDR	
COST	• PERFORMANCE TO STANDARDS	
	• OVERTIME	
	• LOST TIME	
SCHEDULE	• DELIVERY TO INTERNAL SCHEDULE	

• ACTION ITEMS (PERFORMANCE INHIBITORS)

PMT OPERATING GUIDELINES

- WORK GROUP SUPERVISOR FUNCTIONS AS TEAM LEADER
- FACTORY SUPPORT GROUPS ARE INTEGRAL/ACTIVE PART OF TEAM (PROD ENGR; IND ENGR; QUAL ENGR; QUAL INSP; PLNG & CONT; TEST OPS; ETC.)
- GENERAL FOREMAN AND MFG MANAGER PROVIDE GUIDANCE/COUNSEL
- TEAM MEETS 1 HOUR/WEEK
- SUPERVISOR COMMUNICATES REQUIREMENTS (WHAT IS EXPECTED)
- REVIEW CURRENT PERFORMANCE STATUS CHARTS
- ESTABLISH GOALS TO MEET DEFINED REQUIREMENTS
- IDENTIFY PROBLEMS/CHOKE POINTS INHIBITING PERFORMANCE
  - PROBLEMS LIMITED TO TEAM'S WORK AREA/RESPONSIBILITIES
  - TEAM STAYS OUT OF COMPANY POLICY/UNION ISSUES
- ASSIGN ACTION ITEMS TO RESPONSIBLE TEAM MEMBER(S)
- PARTICIPATE IN PROBLEM RESOLUTION
- SUPERVISOR BUBBLES UP THE "TOO HARD" PROBLEMS
  - FOLLOWS UP TO ENSURE TIMELY CORRECTIVE ACTION

PERFORMANCE MEASUREMENT TEAM

(PMT) PROGRAM

EXPECTED RESULTS:

- IMPROVED PRODUCT QUALITY - HARDWARE YIELDS
- EARLY PROBLEM IDENTIFICATION
- TIMELY CORRECTIVE ACTION
- COHESIVE TEAMS WITH COMMON GOALS
- IMPROVED COMMUNICATION
- IMPROVED COST PERFORMANCE
- SCHEDULE PERFORMANCE/ON TIME HARDWARE DELIVERY
- CREDIBLE DATA/MANAGEMENT REPTS

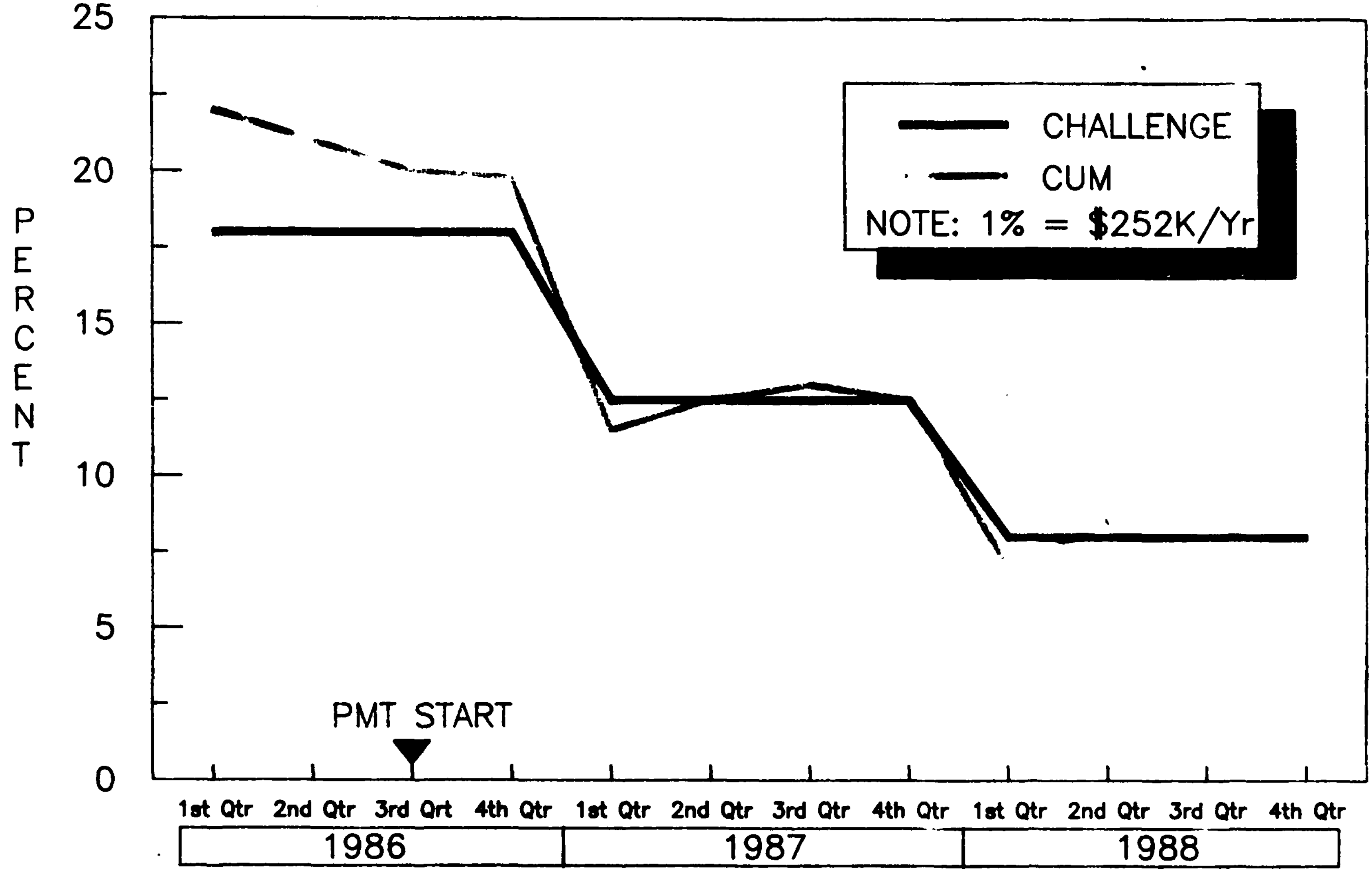
BOTTOM LINE:

"OWNERSHIP BELONGS TO 1ST LINE SUPERVISOR"
- INDIVIDUAL PERFORMANCE EVALUATIONS BASED ON RESULTS -

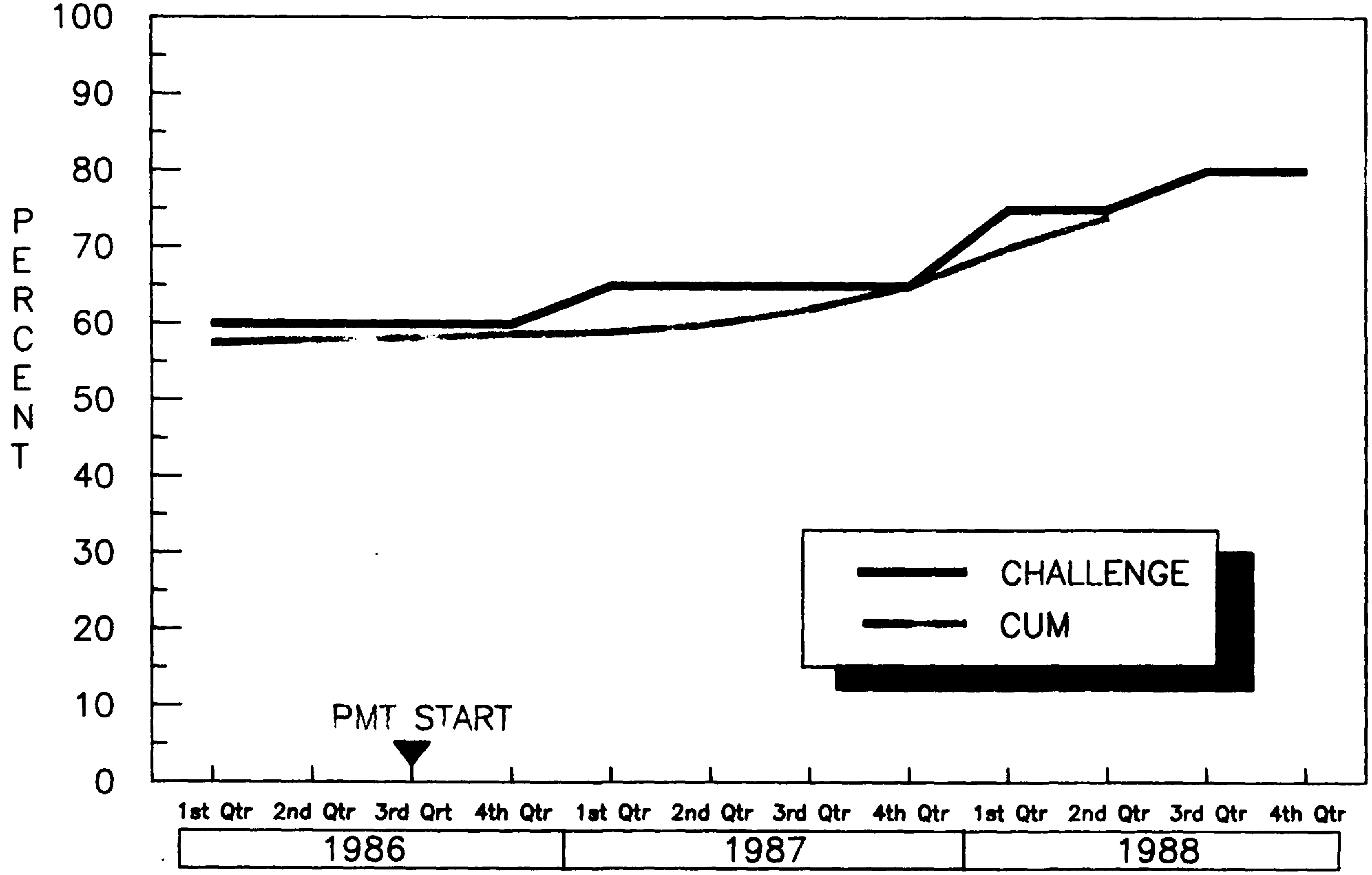
PERFORMANCE MEASUREMENT TEAMS (PMTs)

MANUFACTURING FUNCTION	
MANUFACTURING OPERATIONS	37
MISSILE SYSTEMS FINAL ASSEMBLY	14
PRODUCTION CONTROL	13
PRODUCTION & TEST ENGINEERING	4
TOTAL	68*
QUALITY	
CALIBRATION LABORATORY	2
QUALITY ENGINEERING (CENTRAL & PRGM)	1
HELLFIRE	
PERSHNG	
PATRIOT	
COPPERHEAD	
SLAT	
RECEIVING INSPECTION (PROCESS SIMPLIFICATION)	2
TOTAL	5

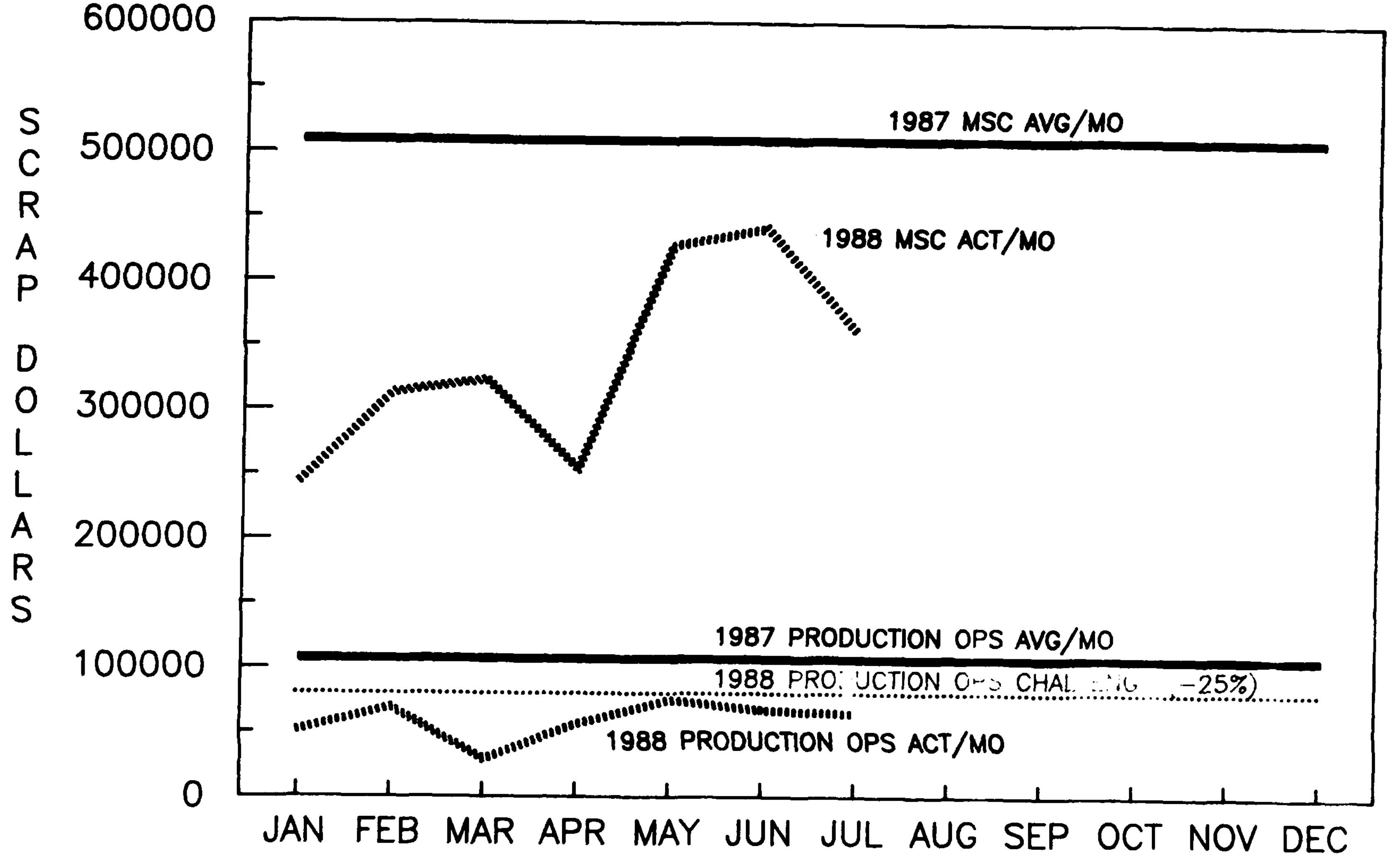
PRODUCTION OPERATIONS OVERTIME



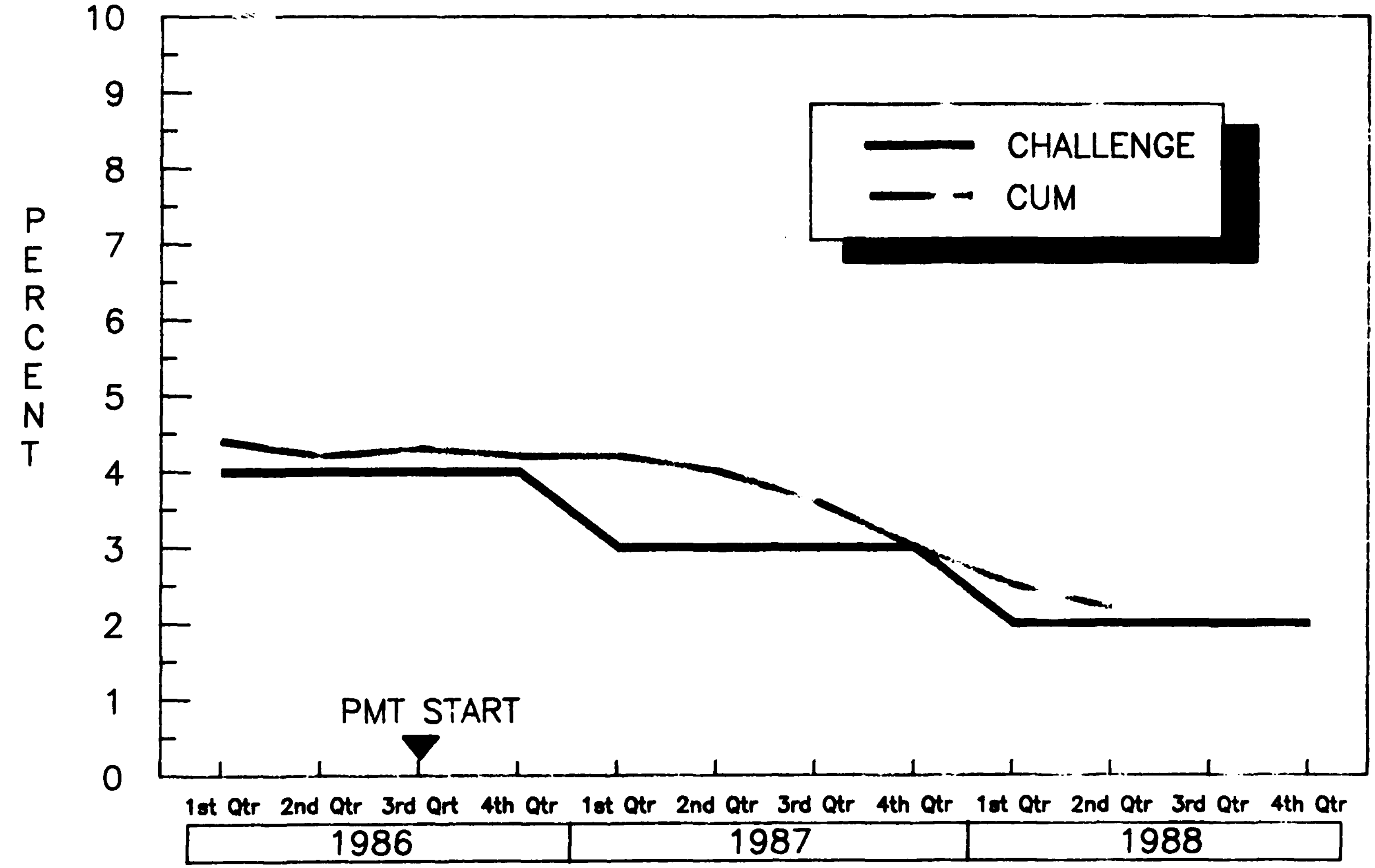
PRODUCTION OPERATIONS PERFORMANCE TO STANDARDS



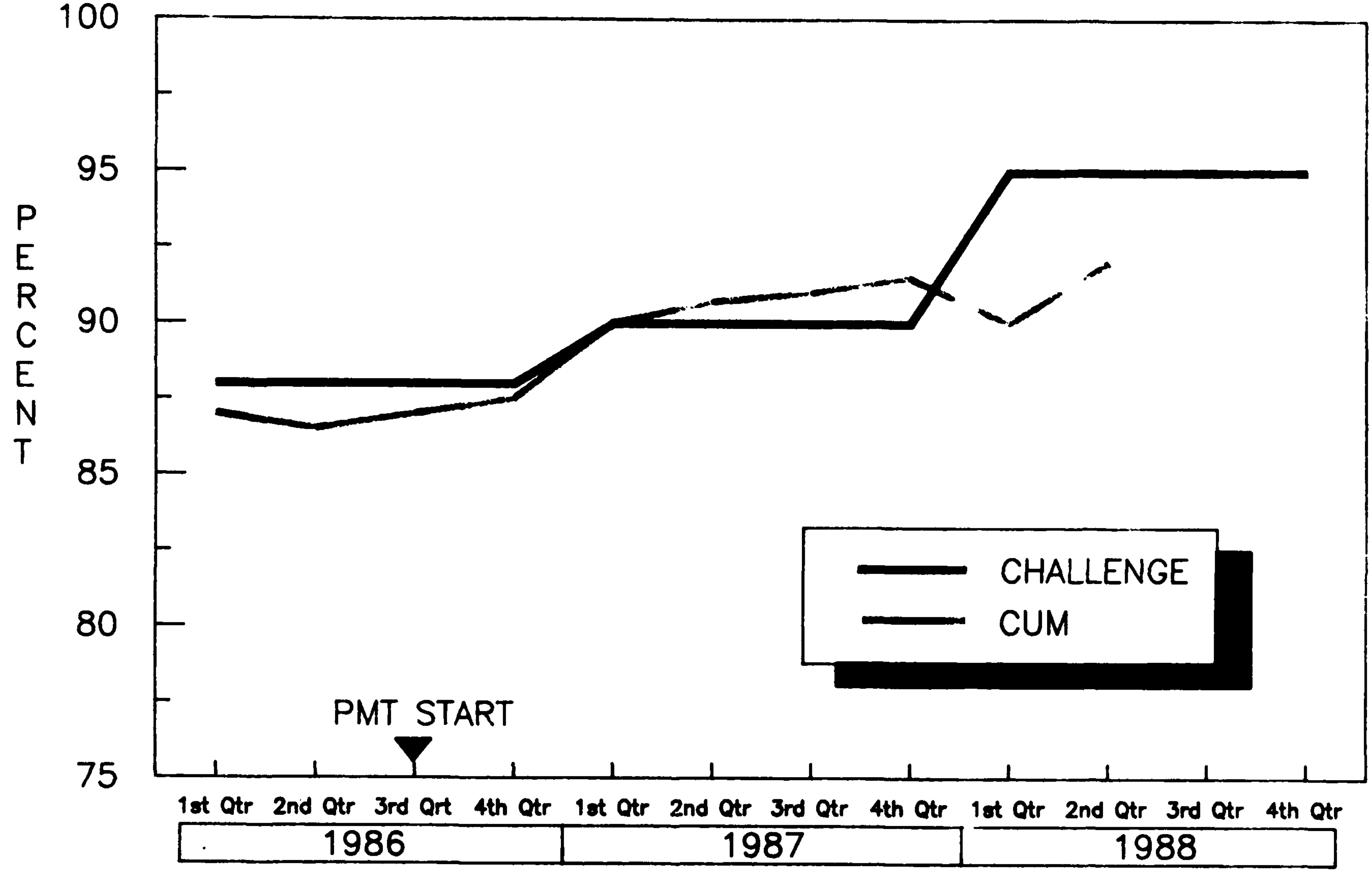
PRODUCTION OPERATIONS vs TOTAL MISSILE SYSTEMS SCRAP PER MONTH



PRODUCTION OPERATIONS MFG. REWORK

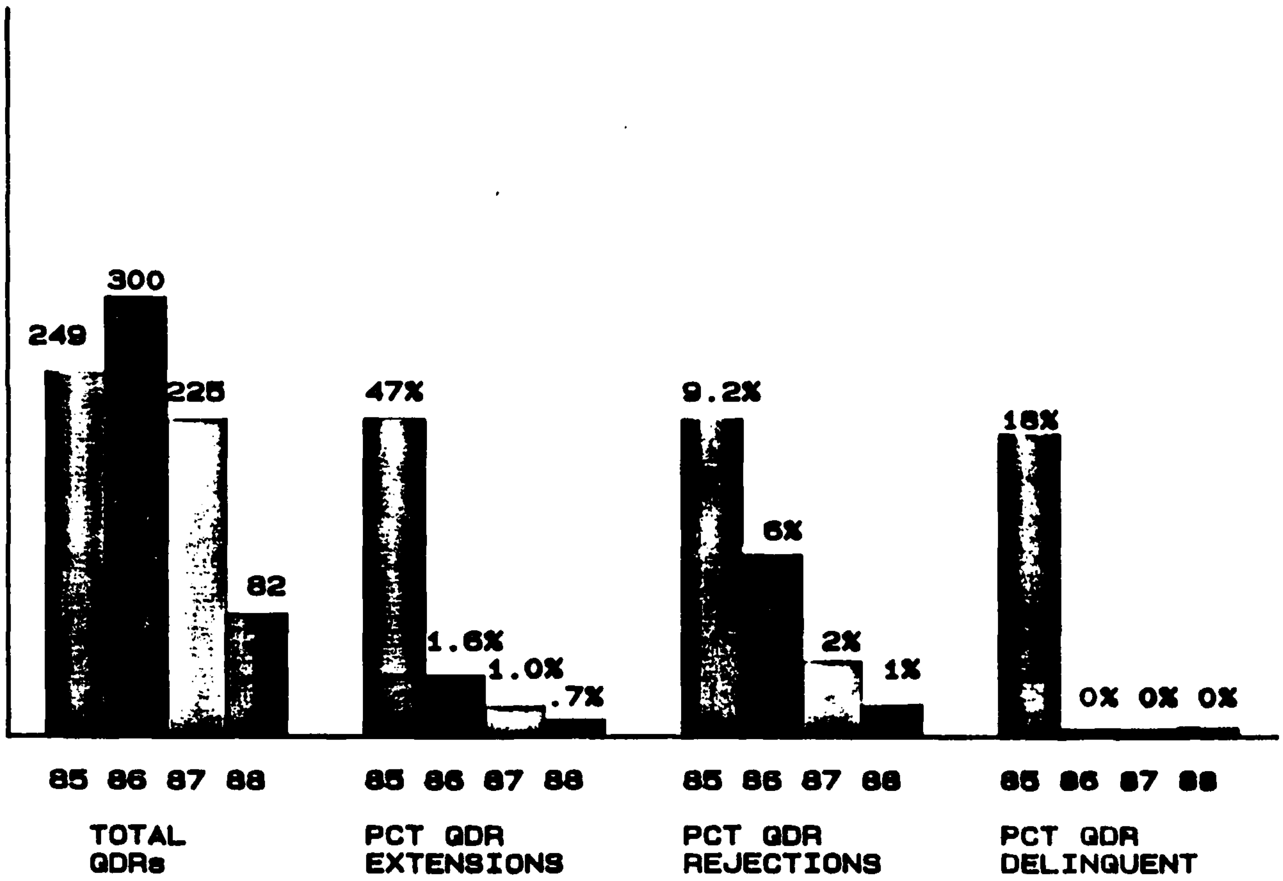


PRODUCTION OPERATIONS YIELD



QDR STATUS REPORT

AUG 15, 1988



QDRSTA10

Recommendations

* Establish Total Quality Management (TQM) as a way of life in DoD.
* Have all DoD personnel directly doing continuous process improvement.
* Implement widespread defense industry continuous process improvement.
* Obtain Congressional understanding of and support for TQM.
* Eliminate barriers to TQM implementation.
* Harmonize DoD Directives/Regulations/Instructions and TQM.
* Implement commitment by major defense contractors.
* Develop, produce, acquire, and promulgate a standard set of TQM training materials.
* Coordinate the DoD TQM effort with other sectors of the Federal Government.
* Establish DoD Executive Steering Committees (2)
* Develop and implement the TQM training strategy.

1988 DOD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

PANEL 3 SESSION A

PARTS CONTROL

The DoD Parts Control Program (PCP) has been a very successful program within DoD; however, education is still needed for the Program Managers to effectively implement the mandatory program. Panelists will provide an in-depth overview of the PCP through discussions on policies and procedures; Military Parts Control Advisory Groups (MPCAG's); implementation of the PCP by contractors; application and implementation of the PCP; and program audit and findings/recommendations. These topics will be addressed in hopes that attendees will return to educate their colleagues.

CHAIR: Mr. Ronald A. Kunihiro, Senior Staff Engineer, OASD(P&L)DPSO

PANELISTS: Mr. Glenn H. Bogel, Staff Engineer, Magnovox Electronics System, Ft. Wayne, IN
Mr. Rodger Fulton, Engineering Chief, General Dynamics, Ft. Worth, TX
Mr. Charles C. Packard, Manager, Component Engineering, IBM Fed System Division, Owego, NY
Mr. Donald K. Swanson, Dep. Director, Engineering Standardization, DESC
Mr. Terrance P. Wing, Supervisory Auditor, Office of Asst. Inspector General for Auditing

PANEL 3 - SESSION A

DISCUSSION:

The DOD Parts Control Program (PCP) has been a very successful program within DoD; however, eductation is still needed for the Program Managers to effectively implement the mandatory program. The concept of the PCP is nothing new. It began in the early 1960's. During the 60's numerous studies had been performed in the areas of logistics management, item entry control, and parts proliferation. The bottom line in all the reports was -- "Standardization must occur during Design". Once a part is selected by a designer it is virtually impossible to make a change. Therefore, the objective of the PCP is to review parts intended for use in design.

The PCP was formally recognized as a cost effective program in the mid 1970's. Since its inception the program took numerous forms. Contractors were burdened with meeting the requirement for a parts management program with differing requirements. In 1977 a DoD Instruction 4120.19 was isssued to integrate the PCP into a single DoD system. The Instruction also emphasized the policy to standardized parts selection during design. Although the policy called for standardization during design, in 1983 the DoD was criticized by the news media for not controling the entry of new items into the DoD inventory. $400 hammers and $3000 coffee pots were headline news. As part of his overall acquisition reform, the then Secretary of Defense Casper Weinberger supported a policy direction to mandate the application of the PCP on all weapon system and equipment contracts. The DoD Instruction 4120.19 was revised in 1984 to reflect this policy and since that date the policy is unchanged. (See DoD I 4120.19 for detailed policy statement)

Mr. Don Swanson from the Defense Electronic Supply Center explained that the PCP provided a control to avoid proliferation of contractor unique parts, encourage the reuse of engineering data, centralized group of component engineers for DoD, and enhance system reliability at the component part level. He further explained the benefits of the program through standardization of design documentation, reduction in new part testing , reduction in supply management (fewer National Stock Numbers), and a definite improvement in maintenance actions (fewer field failures).

Messrs Rodger Fulton and Glenn Bogel described their experiences with the implementation of the PCP on their respective weapon system contracts. Their company objectives are to minimize part types and assure that reliable/quality parts are used in design. The reasons for the success of the program at General Dynamics Fort Worth, Tx. are: 1) an integrated team working to solve the parts problems, 2) parts requirements are imposed on subcontractors, 3) maximum use of military/industry standard parts and 4) the use of streamlined method to have parts reviewed and evaluated by the Government. At Magnovox Electronics System, Ft. Wayne, IN the program is declared successful because of the expansion of information through a cooperative working environment. The Miliatry Parts Control Advisory Groups (MPCAGs) have been most helpful in assisting the contractors obtain current parts informantion.

Mr. Charles Packard, IBM, presented a brief overview of the Standardized Military Drawing Program. The SMD is a standardized documentation methodology which allows the detailed requiremnts for a specific generic electronic component (currently only microcircuits) to be represented on a single drawing. Hence creating a one part/one part number system. The importance of the SMDP is that it minimizes acquisition and logistics costs associated with DoD application of electroinc components while improving off-the-shelf availability and extending manufactruing life (DMS). Industry has estimated a savings of $641 M by implementing the program on all major weapon system and equipment contracts and if program offices do not allow waivers and deviations to the contractors.

Mr. Terrance Wing, Office of Assistant Inspector General for Auditing, provided a status report on their recent audit of the PCP. A previous audit found that the PCP was not working as intended, bascially because of problems with policy and procedual guidance. Corrective action were as follows: procedures revised to address audit recommendations; initiate a program for quality assurance personnel to monitor contractor compliance; and actions taken to emphasize importance of services providing feedback to advisory groups on implementation of recommendations. Findings of the current audit are as follows: 1) contracts did not contain appropriate parts control provisions; 2) contractors did not submit all required parts for advisory group evaluation ; 3) contracts that contained parts control provisions were not always monitored by contract administration personnel; 4) procuring activities did not always provide the advisory groups with feedback about implementation of advisory group parts recommendations; 5) procedures were not established for the advisory groups to analyze the feedback data that was provided so that program accomplishments could be evaluated; 6) procuring activities were not requiring contractors to use government furnished baseling parts lists as the primary sources in selecting parts,and there were no procedures to consider the baselines in evaluating contracor's responses to requests for proposals and 7) government furnished baseline parts lists did not contain the manximum number of parts for contractors to make selections. In summary the DoD IG supports a properly implemented DoD PCP and believe it will result in significant design and logistics cost avoidances in the DoD acquisition process.

RECOMMENDATIONS:

As a result of the panel presentations and audience participation, the following recommendations were developed:

1) Adjust parts submittal time schedule. A review will be made and adjustments consisdered to the requirement for the submission of parts evaluation 30 days after award of contract. A suggestion was made that the time schedule coincide with the system/equipment contract milestones, e.g. commensurate with critical design review.

Action Office: Preparing Activity of MIL-STD-965. Air Force.

2) Reduce part evaluation/approval time. The use of automation and electronic data submittal should improve on part evaulation/approval time.

Action Office: The DLA and Service Military Parts Control Advisory Groups

3) Expand the Standardized Military Drawing Program. Currently the SMDP is approved for use only in the microcircuit area. Numerous requests have been made to expand the coverage to include other electronic classes.

Action Office: The Defense Product Standards Office

4) Provide feedback on field failure data. Equipment designers and the MPCAGs need field failure data to improve the reliability and quality of systems and equipments deployed to the troops. A DoD wide program is being established through the Joint Logistics Commanders group. A letter will be sent to Dr. Costello from the senior members of the JLCs requesting his support and endorsement.

Action Office: Military Services' Reliability Offices.

5) Provide program unique requirements to MPCAG's. Program managers must provide program unique requirements to the MPCAGs so that a more accurate part evaluation service can be provided.

Action Office: Military Service's contracting offices

6) Implement the DoD IG recommendations. The recent DoD IG audit resulted in several constructive recommendations. We must assure that the recommendations are implemented.

Action Office: DPSO, Army, Navy, Air Force, and DLA

1988 DOD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

PANEL 3 SESSION B

RIGHTS IN TECHNICAL DATA--ISSUES AND CONTROVERSIES

The panel will address the questions: Technical Data Rights--Whose rights are right? What's right for tomorrow? When are rights wrong? Where are rights going? Why do rights matter? Responses to the who, what, when, where, and why for data rights will be given by both industry and Government panelists, resulting in an invigorating dialogue.

CO-CHAIRS: **Mr. Carl L. Berry, Director, Defense Data Management Office, OASD(P&L) and**
Ms. Bettie S. McCarthy, Washington Representative, Proprietary Industries Association

PANELISTS: **Mr. Alan Chvotkin, Senior Corporate Attorney, Sundstrand Corp., Arlington, VA**
Mr. Jonathan L. Etherton, Professional Staff Member, Senate Armed Services Committee
Ms. Linda E. Greene, Navy Representative to DAR Council, OASN(S&L)
Mr. Fred Kohout, OASD/DASD(P)

Summary for Rights in Technical Data Panel

Discussion

The rights in technical data panel was co-chaired by representatives from both DoD and Industry. Panelists represented a cross section of Congress, Industry and DoD personnel. This mix of interests provided an excellent balance regarding industry's concerns over the interim rule vice DoD's requirements to promote commercialization and improve the reprocurement posture of spares.

The panelists discussed the meshing of the issues of delivery of technical data and rights in technical data, definitional problems, compliance and administrative burdens, and the need to balance industry's and government's legitimate interests via rights in technical data.

Finding #1 - A great deal of concern and opposition remains within industry regarding the interim rule's provisions for rights in technical data.

Finding #2 - Industry is concerned as to how protection and tracking will be handled regarding data that has limited or GPLR legends in terms of internal or 3rd party contractor use.

Finding #3 - Stability and a viable regulation are needed to ensure the data rights goals of DoD and industry.

Recommendations

#1 - Investigate the feasibility of adding the limited rights legend requirements in the proposed draft MIL-Standard for distribution and marking statements. Action Office - DDMO.

1988 DOD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

PANEL 4 SESSION A

INTERNATIONAL STANDARDIZATION (RSI)

The following topics will be discussed by the panelists:

- o Application of NATO STANAG's, AQAP's, ASTANP'S, AP'S, QSTAG'S, etc., by the U.S. Military Departments in defense systems acquisition planning and management for increasing interoperability and intersupportability of alliance defense forces.
- o Benefits and problems involved in multinational adoption and use of foreign national specifications and standards for defense materiel acquisition.
- o Increased importance of appropriate participation by DoD technical experts in development, coordination, and application of international ISO-IEC standards sponsored by SAE, EIA, AIA, ASME, IEEE, and other non-Government organizations.
- o The need for a more efficient procedure for coordination, ratification, and implementation of NATO STANAG's and other standardization agreements.

CHAIR: Mr. Samuel P. Miller, Assistant for International Standardization, OASD(P&L)DPSO

PANELISTS: Mr. David Bentley, Mgr, Air Space Technology Div., SAE, Inc., Warrendale, PA
Mrs. Barbara Boykin, Director, Standardization Programs, AIA, Washington, D.C.
Mr. William C. Brittain, Assistant Director, Engineering Maintenance Planning and Standardization, National Defense, HQ, Canada
Col Robert E. Potts, Chief, Interoperability & Standards Office, Office of Dir. of Information Systems for C^4
LTC Ron Smith, Chief, International Standardization, Marine Air Ground Task Force Warfighting Center, USMC, Quantico, Va.

1988 DoD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE, 22-24 AUG 88

REPORT OF PANEL 4, SESSION A on INTERNATIONAL STANDARDIZATION (SI)

Submitted by CHAIRMAN Samuel P. Miller, DPSO

DISCUSSION:

One-hundred-and-seven representatives for DoD, other Government agencies, industry associations, professional societies, defense industries, and non-Government standards organizations were present at the Panel 4, Session A, conference to hear the presentations made by the five panelists and participate in ensuing discussions. The meeting was opened at 8:30 a.m. and conducted in accordance with the attached PROGRAM schedule. Five very pertinent presentations and discussions were presented by the panel members as noted in the PROGRAM. The panel members represented the aerospace industries, the automotive engineering society, the Canadian Ministry of Defense, the U.S. Army, and the U.S., Marine Corps. The Chairman and Panel Members were selected because of their experience and demonstrated capabilities in management of international standardization programs as noted in the Background Briefs provided with the attached PROGRAM document. The keen interest of the astute audience was evident from the very pertinent questions and comments offered by the many attendees who participated in the discussions following each presentation.

FINDINGS:

The basic findings resulting from the International Standardization conference were: a) the impact of international standards on the U.S. defense industry, the general national economy, and DoD acquisitions has increased very significantly over the last 8 years; b) many U.S. industrial standards and Government standards previously used world wide are being replaced in many countries by international standards; c) To remain competitive in the world market, both industry and Government must give more attention to influencing international standards bodies to reflect U. S. technology, industrial engineering and manufacturing practices, and quality requirements in international standardization documents; d) there is a general lack of knowledge in Government and industry concerning the potential impact of international standards and the ways and means of making them more advantageous to U.S. industry and Government agencies; e) the continued effectiveness of NATO alliance for promoting and maintaining world peace through combined strength is

becoming more and more dependent on increased standardization for improving interoperability of the NATO national armed forces; f) the coordination process for NATO and ABCA standardization documents with DoD and industry must be made more efficient and comprehensive; g) adoption of international standards must be thoroughly evaluated to ensure against incompatibility with U.S. industrial requirements and capabilities.

1988 SDM CONFERENCE BALTIMORE, MD
22-24 AUG 1988
AGENDA for Panel 4, Session A
on
International Standardization (RSI)
0830 - 1135 24 Aug 1988

CHAIRMAN:

Mr. Samuel P. Miller
Assistant Director - International Standardization
Defense Product Standards Office
OASD (P&L) PS/SDM

PANEL MEMBERS:

Ms. Barbara Boykin
Director of Standardization Programs
Aerospace Industries Association of America, Inc.
Washington, DC

Mr. David R. Bentley
Manager, Air and Space Technical Division
Society of Automotive Engineers (SAE)
Warrendale, PA

Mr. William C. Brittain
Manager, Standardization Section
Directorate of Engineering and Maintenance
Planning and Standardization
Canadian Ministry of Defense
Ottawa, Ontario, CA

Col. Robert E. Potts
Chief of Interoperability and Standards Office
Office of Director of Information Systems
for Command, Control Communications and Computers
US Department of the Army
Washington, DC

LCol Ronald L. Smith
Head, Office of Combined Doctrine
Headquarters, US Marine Corps
Quantico, VA

PROGRAM COORDINATOR:

Mr. Tom Ballantine
Staff Assistant - International Standardization
Defense Product Standards Office
OASD (P&L) PS/SDM

PROGRAM

0830:

Welcoming remarks by Chairman
Introduction of Panel Members
Brief Presentation on Purpose of Panel 4 - Session A

0845:

Presentation: **"Standardization for Battlefield Interoperability"**
by Col Robert E. Potts, US Army

0905:

Audience Question and Comments and Panel Response

0915:

Coffee Break

0935:

Presentation: **"Voluntary Standards - Why Should DoD Care?**
by Ms. Barbara Boykin

0955:

Audience Questions and Comments and Panel Responses.

1003:

Presentation: **"Use of Standards in Defense Materiel Acquisitions - Canadian Perspective."**
by Mr. William C. Brittain

1023:

Audience Questions and Comments and Panel Responses

1031:

Presentation: **"The Roles of SAE in The International Standards Arena."**
by Mr. David Bentley

10:51

Audience Questions and Comments and Panel Response.

11:00

Presentation: "US Marine Corps Participation in Military Standardization."
by LCol Ronald L. Smith, USMC

11:20

Audience Questions and Comments and Panel Response

11:28

Closing Remarks by Chairman

11:35

End of Session A
Dismissal to Wrap-up Luncheon.

Related Background Briefs
on
PANEL MEMBERS
Panel 4, Session A
International Standardization (RSI)

SAMUEL P. MILLER:

Mr. Miller, professional engineer since 1957, has been involved with international standardization work during the last 25 years. For eleven years he served as Division Manager and Vice President for a U.S. manufacturer of defense products involved in international trade. For three years he was the DoD representative on the ANSI committee for International Standards. For eleven years since 1977 he has represented the DoD on the NATO AC/301 Main Group for Materiel Standardization. From 1980-1984 he served as the OSD representative on the DoD Interservice Working Group for International Military Standardization having action responsibility for NATO and ABCA standardization. Since 1985 he has served as a member of the U.S. delegation to the NATO AC315 Standardization Group and the NATO AC/135/AC301 Joint Group on Codification and Standardization.

COL. ROBERT E. POTTS, US ARMY:

Col. Potts has been an Electrical Engineer and Officer in the U.S. Army since 1964. During the last three years he has been engaged directly in the development and implementation of international standardization policy and procedures especially applicable to the Army agencies and military commands. His primary international standardization activities have included interoperability requirements for communications systems, terminology, and software, a critical need in accomplishing interoperability of the allied forces of NATO and other alliance organization.

BARBARA BOYKIN:

Ms. Boykin has been directly involved in international standardization articles of the aerospace industry for more than twelve years. During those years she has managed the Secretariat services for the Technical Committee (TC) 20, one of the most productive Standards development committees of the International Organization of Standardization (ISO). She has also represented the Aerospace Industries on the ANSI International Standards Committee. She represents the AIA in meetings with the foreign aerospace standards organization, AECMA, Association of European Contractors for Aerospace Materiel. She has made major contributions to a number of studies and reports on international trade and standardization impacting the U.S. aerospace industry. She participates in the DoD/Industry coordination review of NATO international standards which impact the aerospace industry.

WILLIAM C. BRITTAIN:

Mr. Brittain has been an Electrical Engineer since 1964 and served for 14 years as an officer in the Canadian Armed Forces, responsible for Communications Electronics Engineering. Since 1980, he has been the Canadian delegate to the NATO AC/301 Main Group for Materiel Standardization. He serves on several special international committees involved in standardization of engineering practices and technology. He is currently Chairman of the ABCA international Working Group on Engineering Standardization for Army materiel and represents the Canadian Ministry of Defense in the ABCA Navy Field Programs Group addressing interoperability problems.

Related Background Briefs
on
PANEL MEMBERS
Panel 4, Session A
International Standardization (RSI)

LCOL RONALD SMITH, USMC:

LCol Smith has been a professional scientist since 1963 and has served for 21 years as an officer in the US Marine Corps, specializing in artillery and war operations planning for the Vietnam Forces and the NATO Allied Forces in Europe. He currently is responsible for the development and implementation of interoperability Dctrine, Tactics, Techniques and Procedures to be applied to the Marine commands.

DAVID R. BENTLEY:

Mr. Bentley has been a Professional Technologist for more than 18 years specializing in automotive components engineering design and development. During the last 10 years he has had major responsibilities for the management of the standardization programs sponsored by the Society of Automotive Engineers (SAE). In the last 4 or 5 years he has become directly involved in international standardization projects of the ISO TC/20 committee. He has also served as a participant in NATO working groups involved in evaluation of national industrial standards proposed for adoption by NATO.

Samuel Miller

INTERNATIONAL STANDARDIZATION

RATIONALIZATION, STANDARDIZATION AND INTEROPERABILITY

PRINCIPAL INTERNATIONAL STANDARDS DEVELOPMENT ORGANIZATIONS WHICH IMPACT U.S. DEFENSE ACQUISITION

NATO	NORTH ATLANTIC TREATY ORGANIZATION - 16 NATIONS
ABCA	AMERICAN BRITISH CANADIAN AUSTRALIAN ALLIANCE
ASCC	AIR STANDARDS COORDINATING COMMITTEE UNITED STATES - UNITED KINGDOM - CANADA - AUSTRALIA - NEW ZEALAND?
AECMA	ASSOCIATION OF EUROPEAN CONSTRUCTORS OF MATERIEL FOR AEROSPACE
IEC	INTERNATIONAL ELECTROTECHNICAL COMMISSION
ISO	INTERNATIONAL STANDARDIZATION ORGANIZATION
CENELEC	EUROPEAN COMMITTEE FOR ELECTROTECHNICAL STANDARDIZATION W/MILITARY ADVISORY GROUP (MUHAG)

NATO STANDARDIZATION ORGANIZATION

- **MILITARY AGENCY FOR STANDARDIZATION (MAS)**

  - STANDARDIZATION OF TACTICAL DOCTRINES, OPERATIONAL PROCEDURES, AND LOGISTICAL PROCEDURES FOR INTEROPERABILITY AND INTERSUPPORTABILITY OF ALLIED DEFENSE FORCES

- **NATO STANDARDIZATION GROUP (NSG) AC/315**

  - STANDARDIZATION PROGRAMS ASSESSMENT AND MANAGEMENT
  - SENIOR-LEVEL NATIONAL DEFENSE STANDARDIZATION OFFICIALS
  - PERMANENT HEADQUARTERS STAFF GROUP
  - IMS, CNAD AND MAS REPRESENTATION

- **COUNCIL OF NATIONAL ARMAMENTS DIRECTORS (CNAD)**

  - MATERIEL STANDARDIZATION FOR ACHIEVING COMPATIBILITY, INTEROPERABILITY, AND INTERSUPPORTABILITY OF DEFENSE SYSTEMS AND SUPPORT EQUIPMENT
  - ADMINISTRATIVE, ENGINEERING PRACTICES, AND QUALITY CONTROL STANDARDS FOR EFFICIENT, ECONOMICAL COOPERATION
  - TOP LEVEL NATIONAL DEFENSE ACQUISITION OFFICIALS
  - MULTIPLE TECHNICAL SPECIALISTS GROUPS

COMMONALITY

THE SAME *IDENTICAL* DOCTRINE, PROCEDURES, AND EQUIPMENT USED IN MORE THAN ONE FUNCTIONAL APPLICATION OR BY MORE THAN ONE NATO NATIONAL FORCE.

INTERCHANGEABILITY

SOME MATERIAL COMPONENTS ARE FUNCTIONALLY AND PHYSICALLY *INTERCHANGEABLE* AND THE SAME IN *PERFORMANCE & DURABILITY*, BUT NOT NECESSARILY IDENTICAL (IDENTICAL ITEMS ARE INTERCHANGEABLE)

COMPATIBILITY

ITEMS CAN *FUNCTION TOGETHER*

IN THE SAME SYSTEM

WITHOUT MUTUAL INTERFERENCE.

(TOLERANCE)

INTEROPERABILITY

ABILITY OF SYSTEMS, UNITS, OR FORCES TO *EXCHANGE SERVICES* FROM OTHER SYSTEMS, UNITS, OR FORCES

AND

TO USE THE SERVICES SO EXCHANGED TO ENABLE THEM TO *OPERATE EFFECTIVELY TOGETHER.*

COL Potts
U. S. Army

STANDARDIZATION AND BATTLEFIELD INTEROPERABILITY

This conference was convened to address timely issues affecting defense acquisition. The theme "Supporting the Acquisition Process" was chosen to recognize the role standardization and data management have in improving the quality and reliability of defense materiel. I can't tell you that I'm on target, but I think my job is to provide some insight into the policies and procedures that govern the use of standards.

This session was billed as a session on International Standardization (RSI). What is RSI and how does it relate to International Standardization? We need to discuss that and I have some thoughts on that to share with you. Unfortunately this could lead us into one of those sessions that are not very productive. We could debate precise definitions for the remainder of the morning. I would like to preclude that. Maybe we could just work in terms of attitude and intent?

To start with, I view International Standardization as a concept. We could discuss STANAGs or QSTAGs or other International

Standards. Maybe we will. But if we do that we must have a better understanding of how we get from standards to standardization and why we should look beyond that to RSI. Even more critical from my perspective we have to look at Battlefield Interoperability.

What is RSI? I can tell you what the R, the S, and the I stand for and I will do that to set the record straight. R is rationalization. S is standardization, and I is Interoperability. And so the circle goes. Now I suppose you want me to tell you what they are. I will try, but we really need to talk about this.

What about the new term Battlefield Interoperability? We will get to all of that, but let me go back to the beginning to start.

The nature and demands of modern warfare, especially in a mature theater such as Europe and the increased importance of conventional forces to deterrence, make it essential that NATO Alliance forces have the demonstrated ability to fight together effectively. The Warsaw Pact, by virtue of clear Soviet predominance has achieved an impressive degrees of homogeneity in equipment, doctrine and tactics, and command and control.

Further, the expense and complexity of modern weapons systems, the decline of military-eligible population in many Western European countries; and conflicting demands and political pressures within

the Alliance place a premium on equitable burden sharing among Alliance partners. Achieving this peacetime objective of making the best use of Alliance resources contributes to warfighting capability. These actions enhance NATO 's ultimate goal of deterrence.

Achievement of improved battlefield interoperability is a way of achieving greater warfighting capability. We work with our Allies every day, and have charted impressive progress since the first REFORGER exercises highlighted how poorly we conducted tactical exercises with our Allies. This situation is no longer true. Today, we have broad ranging acceptance and application of each other's tactics, techniques, and procedures. We have improved dramatically our mutual ability to share tank and artillery ammunition, petroleum products, share wholesale logistical support, and medical facilities.

An example of weapon system standardization is our fielding of the Multiple Launched Rocket System in six NATO Armies demonstrating the ultimate benefits of cooperative R&D. Acquisition of the British 105mm light gun, the medium girder bridge, and the joint venture on mobile subscriber equipment are evidence of greater traffic on the two way street advocated by our NATO Allies.

Where we must go, however, is a more important question than where we are now. Clearly, we have to achieve interoperable communications and automation. Furthermore, more must be done to improve logistical procedures and field interchangeable consumables. We must continue to develop common Joint and Combined doctrine to further enhance Allied warfighting potential.

Emphasis on all facets of RSI must be employed to use Alliance resources to best effect. In the near term we need to expand existing host nation support agreements with special emphasis on wartime needs. Treater application must be made of common use facilities constructed, staffed, and maintained by our Allies. Our progress on common logistics support should be institutionalized in multinational activities like the NATO Maintenance and Supply Agency and broadened with consortia funding for special projects. Finally, armaments cooperation must support forward deployed forces by making greater use of cooperative R&D programs and direct acquisition of Allied weapons systems.

Just to set the record straight I said I would define what we are talking about. So for the record,

RATIONALIZATION

Any action that increases the effectiveness of alliance forces through more efficient or effective use of defense resources committed to the alliance. Rationalization includes consolidation,

reassignment of national priorities to higher alliance needs, standardization, specialization, mutual support, improved interoperability, or greater cooperation. Rationalization applies to weapons, materiel resources, nonweapons military matters and communications.

STANDARDIZATION

Within NATO the process of developing concepts, doctrines, procedures and designs to achieve and maintain the most effective levels of compatibility, interoperability, interchangeability and commonality in the fields of operations, administration and materiel.

INTEROPERABILITY

The ability of systems, units or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together.

Lets start with Standards. Why do we have standards? Why don't we have standards? Where do they come from, why do we want them? Do we always want them? I don't think these are really very hard questions, but reviewing these questions will lay the foundation for a better understanding of where we are today. As I work through the answers I hope that both the common sense of standardization and real difficulties of obtaining standardization will become more obvious. It is the understanding of the motivation and rational behind standardization and the at the same time recognition of the tough issues that surround standardization that will enable us to properly frame these issues and work toward solving them.

Why do we have standards?

What would you do if the next fancy lamp you brought home wouldn't plug in because it had a nonstandard plug? Or, if the globes burned out and the replacements you bought didn't fit? We have gone far beyond that, and I'm sure that each of you are way ahead of me and have even better examples in mind right now. Why? Is it because of convenience, or is it for economic reasons, or is it just plain common sense?

Why don't we have standards?

Don't we all want a better mouse trap? If you build a better mouse trap and I'm contracting for new mouse traps is it fair for me to only buy the old ones because they are the standard? How can we have fair and open competition if everything is standard? Doesn't that stifle new initiative and preclude new technology?

What comes first? Our National well being or open and fair competition? Wait a minute you say. Isn't open and fair competition in our National interest?

Where do standards come from, why do we want them?

Standards come from many different perspectives. The businessman that wants to corner the market. The new mother that wants a crib

sheet to fit the crib mattress she bought last week. It could even be the US soldier that hopes that German 105 round that he just cambered won't blow the breech and explode in his face. Again, use your own imagination. And then you tell me where we want to draw the line.

Do we always want standards?

So far you would expect me to say yes. But what about technology advances? Do we want to turn down that better mouse trap? The answer, Ladys and Gentlemen, is obviously NO! And that gives us a lot to talk about. How do we work those very profound compromises? If you haven't thought about it before, maybe had a preconceived notion about the good and evil of standards, I plan to complicate you world even more. I'm not going to answer all those questions. What I intend to do is add some perspective to the hows and whys of standardization and the defense of your country.

So far I have alluded to the fact that we have practical reasons, economic reasons, efficiency reasons, and maybe just common sense reasons for standardization. I didn't say anything about standards for standards sake, or just to avoid complete chaos. What I really want you to think about though is standards for the simple reason of interoperability on the battlefield.

Before we get to Battlefield Interoperability we need to discuss RSI. What is it? How does it bridge the gap between standardization and Battlefield Interoperability?

RSI is a journey -- not a destination. RSI is a strategy. So that you will understand where I'm going, just a quick comment on what I mean by strategy. Strategy is one of those overused and abused words that means many things to many people. To some it is a trick or a ruse; to others it is a plan; and, to still others it is simply a way to get something done. To most in the military it is contrast with tactics. Tactics being the employment of units to accomplish a specific mission, and strategy being the overall plan of how to tie each tactical mission into a victory. Businessmen use the term, politicians use the term, we all use the term. When I use the term today I view a strategy as the relationship between the ways and means used toward an end. When I say that RSI is a strategy I intend for you to understand that rationalization is the way to use the means of standardization toward the end of interoperability.

RSI is a way of increasing the coalition warfare capabilities of U.S., allied, and friendly nation forces through the use of common (standard) or interoperable procedures and resources. RSI is applicable to concepts, doctrine, tactics, logistics, procedures, training, and materiel and nonmateriel requirements, and is

essential to the successful integration of allied forces during the conduct of combined operations. RSI goes beyond the definition of the terms "rationalization," "standardization," and "interoperability." It does not imply the existence of a separately managed program, but, rather, a consideration in all programs and a commitment to accomplish those actions that increase the combined combat power of U.S. and alliance forces and that yield the most effective use of resources. Battlefield interoperability is the focus of the Army's RSI activities.

RSI policy should be integrated into the Concept Based Requirements System. Firmly established and agreed concepts can lead to the attainment of RSI objectives through harmonization of doctrine, tactics, techniques, policy, organizational and force structure, training requirements, and materiel developments. Basic Army priorities for RSI are to be able to:

(1) Fight together using agreed common or compatible doctrine, tactics, techniques, and procedures.

(2) Communicate and share data.

(3) Share consumables.

(4) Care for casualties.

As General George Blanchard said way back in 1979,

> "For the practicing professional, ... any debate about the necessity of interoperability is irrelevant and

> does not accurately reflect the nature of current operations in the multinational military environment...History shows that it is not a question of philosophy when one talks about interoperability. On a multinational battlefield, it is a reality with which everybody must cope."

Allied Interoperability is essential to successful combined operations. To achieve interoperability myriad factors come into play. These include an understanding of mutual political and military objectives, a firm grasp of organizational and operational concepts and doctrine, and a constant effort to eliminate sources of confusion and misunderstanding. Working interoperability is not magic, it requires clarity and simplicity in plans and orders and positive attitudes coupled with knowledge and a commonality of goals.

World War II provides ample historical examples of Allied interoperability. Historically, problems have been worked out during wartime by trial and error. Future wars will in all likelihood not afford such a luxury. Inherent in this assumption is a need to achieve maximum Allied interoperability during time of peace. It is our attempt to learn from the past as we prepare for the future. Any major conflict in the future will be joint and most probably combined. Much has already been accomplished to assure interoperability among Allies. Much remains to be done.

Nations of today do not live in isolation. Coalitions and alliances exist to deter aggression, foster security, and project national and alliance aims. Strategic objectives are translated into military objectives and missions for Army forces. To illustrate, U. S. Army missions focus on worldwide commitments reflecting national strategy. These demonstrate our resolve to NATO as well as our intentions to protect other areas of vital interest in the world. Central is a theme of commitment to assist Allies and friends in response to threats anywhere in the world. Our treaty system also reflects our worldwide commitment to deter attacks, maintain the balance of power and stability and to protect access to resources, key facilities and lines of communications.

Future conflicts will be marked by a proliferation of increasingly advanced technology. Operations will be inherently joint and combined. In 1959, President Dwight David Eisenhower stated "Separate ground, sea and air warfare is gone forever. If ever again we should be involved in war, we will fight it in all elements, with all services, as a concentrated effort." Though specifically focused toward unilateral joint operations, President Eisenhower's observations are equally applicable to joint combined operations.

Interoperability will pose a significant challenge on the modern battlefield. Inherent in the challenge will be the need to

integrate a combined arms capability across the various levels of command and throughout the functional areas operating on the battlefield. These functional areas involve battlefield operating systems composed of maneuver, fire support, command and control, intelligence, air defense, mobility and survivability and combat service support.

Operating with combined arms teams, soldiers and leaders must rapidly concentrate decisive combat power. Commanders must be mentally agile and equipment mobility must equal or exceed enemy capabilities.

In future wars, Allies will be required to fight together. Interoperability is essential to successful combined operations. In order to achieve acceptable levels of interoperability we will have to address a number of areas. Common operational concepts, not just the exchange of services, are essential to prepare Allied forces to fight along side each other and to synchronize combat operations. Common operational terminology fosters understanding across international lines thus ensuring soldiers in the field the opportunity to operate with minimum confusion. Compatible equipment affords numerous advantages, ranging from soldiers being able to operate equipment belonging to other Allies to the ability to communicate among Allies with organic communications capabilities. Though recognized as a national responsibility,

interoperable logistics must be a goal on future battlefields. Overall there must be sustained support by political and military leaders for combined operations to achieve success.

The battlefield can be divided into functional areas to assess interoperability capabilities. The Battlefield Operating Systems (BOS) is one way to define these areas on the battlefield. This grouping of related functions and tasks must be executed during war to accomplish the mission. Battlefield Operating Systems provide the construct for analysis, planning, and development of capabilities to meet battlefield requirements stemming from Army wartime missions.

To begin the analysis using the battlefield Operating Systems we break them down by level of command and use a matrix to help visualize the process. This simple two dimensional display is only a beginning because the battlefield is really a multidimensional arena. The matrix is a starting place to look at which commander controls which Battlefield Operating Systems. To understand fully and analyze the interplay between each commander and the Battlefield Operating Systems, we must consider the unit mission and the commander's concept. The focus of any unit's effort is derived from the mission statement and the commander's concept of how to fight and win.

As we go through this process, looking for specified and implied missions, we develop a list of "Mission Essential Tasks." As this list is developed it produces the mission statements for the subordinate commanders and the critical battle tasks that must be accomplished by the force. Development of the critical battle tasks is pursuant to the commander's concept and the probable organization for battle. The critical battle tasks are specific tasks to be accomplished by a particular echelon of the force.

At this point it is useful to review some illustrative examples and to be more clear about which commander must integrate which Battlefield Operating Systems. In this first example, at company level, we find that the company commander really has only two of the Battlefield Operating Systems to employ or integrate. While he is affected by and must rely on each of the Battlefield Operating System, his job is to integrate the maneuver and fire support elements that he controls. He controls the maneuver and fires, both direct and indirect, of several platoons of infantry or armor and that of a mortar platoon. He must also integrate the direct support artillery allocated to him.

History give us the Kapyong example. For our purposes today it is worth restating that the Australians (3 RAR) were in positions extending to Hill 504 with Company A of the 72nd Heavy Tank

Battalion attached. The Patricias (2nd Bn Princess Patricia Canadian Light Infantry) were on Hill 677. The Chinese offensive against these forces was stopped in this sector of the front. The fighting was vicious and successful. Of all the examples we have drawn from this experience, I would like to highlight that when the Patricias needed resupply of rations and ammunition they requested an air drop. Six hours elapsed between the initiation of the battalion commander's request and the C119 air drop of "the right proportions of British and American ammunition and a supply of rations." Only four parachutes fell outside the battalion area. Command and control, communications interoperability, and logistics seemed to have worked well at 1030 hours 25 April 1951.

The next commander on the battlefield must effectively integrate two additional elements of the Battlefield Operating System. The Task Force Commander controls and must effectively bring to bear his maneuver elements, infantry or armor teams, and the fire support allocated to him, much the same as the company commander. He must also employ his scouts to provide intelligence and the air defense assets he controls. These are the organic Battlefield Operating Systems that a Task Force Commander must plan for and integrate into the battle.

In May 1965 the Australian government was deploying a task force centered on the 1st Bn Royal Australian Regiment (RAR). Arriving

in Vietnam during June 1965, the task force was attached to the US 173d Airborne Brigade. Initially, Australian forces performed local security operations. By 11 August troops of the Australian battalion were permitted to take a more active part in operations with the 173d in provinces contiguous to Bien Hoa. Operational control had been granted to the US commander on 5 May and subsequently the US agreed to provide complete administrative and logistical support. Australia repaid the US for this support. As those on the scene can attest a good many of the interoperability lessons learned served all free world forces in good stead when the Australian contingent was expanded to over 4,500. This expansion of combat power enabled the task force to be given more independent missions by basing them in Phuoc Tuy Province under control of the II Field Force Commander.

The Brigade Commander carries the burden of integrating all of the Battlefield Operating Systems into the battle. He is the first commander in the chain of command that actually controls elements from each of the Battlefield Operating Systems. It is the Brigade Commander that must visualize the battlefield, integrate all of the assets from each of the Battlefield Operating Systems into a cohesive force, and command the fight.

The Canadian force was composed of the 13th Infantry Brigade with four infantry battalions. It was organized on American lines with

the Brigade headquarters using the US staff system. In general, Canadian weapons were used with the bulk of other support being of American origin. The combined force made an unopposed landing, 15 August 1943, the Japanese force having withdrawn before the bombardment. Important here for our purposes was the planning done to assure interoperability between the Canadian Brigade and the US division. This planning proved invaluable as the Canadian Brigade remained on Kiska for more that three months.

With these historical examples as a backdrop to point out the necessity of integrating the Battlefield Operating Systems and the recognition that we must considered how this is done at each level of command, we can now turn to the analysis of battlefield interoperability. If we consider the Battlefield Operating System, the METL and the critical battle tasks, we only have to define the interoperability boundaries to provide the final piece of the framework for our analysis. These boundaries are both horizontal and vertical and most often involve only one step in the chain of command, brigade to task force, or adjacent units, brigade to brigade in a division. Some of the Battlefield Operating Systems also encompass an interoperability requirement that goes from a platoon in support of a brigade, such as Air Defense, Engineers, or Combat Service Support, that might find an ammunition point providing ammunition to a multinational force.

This methodology takes specific unit missions, as well as the commander's intent, and breaks them down by Battlefield Operating Systems and looks at the METL and critical battlefield tasks. The division and brigade missions, or portions of them have been used as you see here. With the aid of CPX's and FTX's we can get down to specific requirements for interoperability and thus conduct a better analysis and evaluation of interoperability boundaries and international standardization agreements that have been developed to provide interoperable forces.

The following examples expand the methodology. Here the missions are expanded to identify the METL within the Battlefield Operating Systems for specific levels of command. This example shows the METL from three of the Battlefield Operating System at three different levels of command. To carry this further one Battlefield Operating System, maneuver, was chosen. The.METL and critical battlefield tasks were expanded to illustrate where interoperability is necessary and the kind of tasks that must be standardized or integrated for a multinational force to operate effectively.

For a passage of lines mission this illustrates the tasks a company commander must be able to integrate and accomplish with a multinational force to execute his mission. We must agree to and standardize the procedures required to accomplish each of these

tasks if we expect to interoperate at this level successfully.

At the next level, it must be recognized that interoperability requirements are both horizontal and vertical. While these examples don't discuss agreed tactical levels of interface, recognition of what can be or must be interoperable will help in determining the acceptable make up of multinational forces. If company level critical tasks are not standardized then company level units should not be deployed in multinational task forces. If we make this conclusion, the employment of the US Tank Company with an Australian Task Force would not have been possible at Kapyong. It is clear, however that the horizontal interoperability between Canadian and Australian forces and the vertical interoperability between a US company and an Australian TF was successful at Kapyong either because of or in spite of the interoperability of critical battle field tasks.

At the Brigade level we have run out of options. The Brigade Commander must fight the battle by integrating all of the Battlefield Operating Systems. To succeed, he must have forces that are interoperable in each Battlefield Operating System, both horizontally and vertically. From both the past and the future, the tactics, techniques and procedures must be interoperable.

As we look again at the brigade level we all recognize that it is the commander at this level that has the responsibility for integrating all the Battlefield Operating Systems. This force wil undoubtedly comprise Task Forces of two or more Armies and will be supported by Battlefield Operating Systems provided from the collective interoperable resources of several nations should they be called upon to form an alliance to meet a common threat.

Based on our histories and heritage I offer you this methodology. CPX's and FTX'S must be continued to evaluate the interoperability agreements and identify new areas for agreements, that tactics, techniques and procedures be established for each Battlefield Operating System and the associated METL, and that equipment standardization be prioritized to achieve interoperability in each Battlefield Operating System.

Historically, interoperability problems have been solved by trial and error. In future conflicts, time will not be available to work out these problems by such a process. They must be addressed and resolved prior to conflict. Such agreement will provide a powerful message to potential aggressors. The closer national components of an Allied force resemble each other in organization, doctrine, and equipment, the greater the potential immediate contribution they can make to fight and win should deterrence fail.

I spent most of my time talking about Battlefield Interoperability. The trick was getting through the standards issues to the point of RSI and Battlefield Interoperability. I could talk standards or those issue for hours. But you needed to see where we are taking standards and standardization and how we are trying to use it on the Battlefield. While all the reasons for standards are understood if we take a little time to think about them, I felt the concept of Battlefield Interoperability needed some explanation.

I could have gone through the entire litany of the directives from the White House through Congress, DOD, JCS and even the Service directives and regulations. Those are there, but it is more important to understand why they are there, what they intend, and how we work that guidance.

What I hope I did was to provide some thoughts about an attitude and give us some background so that we can really talk about how some of these things are done and how we can contribute. Perhaps I have raised some questions that will provide some direction for the following session.

I also hope this will provide a basic understanding of how we view standards, why we are so concerned, and perhaps put some perspective on the discussions that we have had for the last two days.

STANDARDIZATION AND BATTLEFIELD INTEROPERABILITY

STANDARDS

STANDARDIZATION

RSI

BATTLEFIELD INTEROPERABILITY

RATIONALIZATION

Any action that increases the effectiveness of alliance forces through more efficient or effective use of defense resources commintted to the alliancs. Rationalization includes consolidation, reassignment of national priorities to higher alliance needs, standardization, specialization, mutual support, improved interoperability, or greater cooperation. Rationalization applies to weapons, materiel resources, nonweapons military matters and communications.

STANDARDIZATION

Within NATO the process of developing concepts, doctrines, procedures and designs to achieve and maintain the most effective levels of compatibililty, interoperabililty, interchangeability and commonality in the fields of operations, administration and materiel.

INTEROPERABILITY

The ability of systems, units or forces to --

(1) Provide services to and accept services from other systems, units, or forces.

(2) Use the services so exchanged to enable them to operate effectively together.

RSI is a STRATEGY

STRATEGY		RSI STRATEGY
WAYS	--------->	RATIONALIZATION
MEANS	--------->	STANDARDIZATION
ENDS	--------->	INTEROPERABILITY

INTEROPERABILITY

THE KEY

TO SUCCESSFUL

COMBINED OPERATIONS

A

WARFIGHTING FOCUS

HQDA
ODCSOPS

COMBINED OPERATIONS

INTEROPERABILITY IS ESSENTIALTO SUCCESSFUL COMBINED OPERATIONS

WE NEED:

- COMMON OPERATIONAL CONCEPTS
- COMMON OPERATIONAL TERMINOLOGY
- COMPATIBLE OPERATIONAL STYLES
- COMPATIBLE EQUIPMENT
- INTEGRATED AIR-LAND OPERATIONS
- INTEROPERABLE LOGISTICS

POLITICAL/MILITARY SUSTAINED SUPPORT

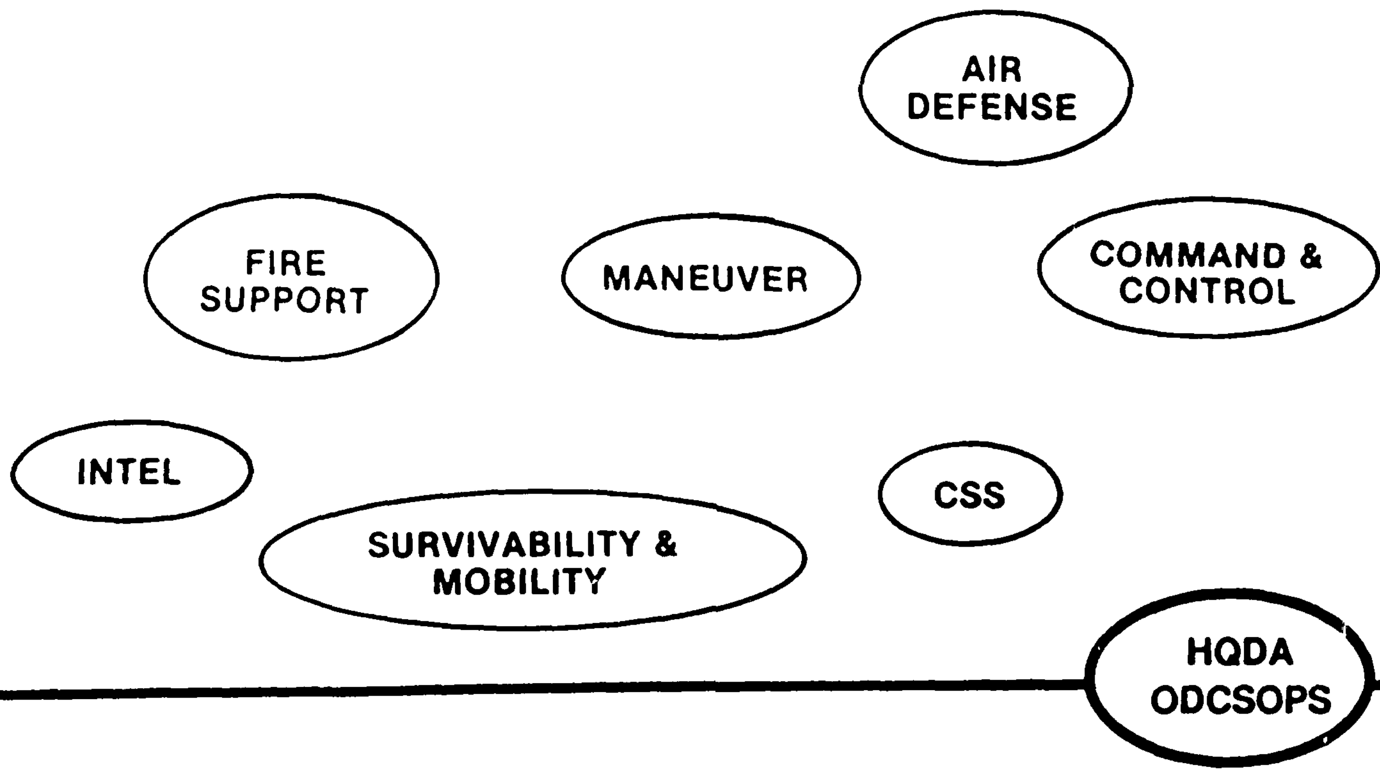
HQDA ODCSOPS

THE SYSTEMS OPERATING ON THE BATTLEFIELD

HQDA
ODCSOPS

THE INTEROPERABILITY CHALLENGE

INTEGRATE COMBINED ARMS CAPABILITY ACROSS LEVELS OF COMMAND AND FUNCTIONAL AREAS



BATTLEFIELD
OPERATING
SYSTEMS

MISSION AREAS AND CONDITIONS AFFECTING BOS

MISSION AREAS

- COMMUNICATIONS
- AVIATION

MISSION AREAS OPERATING THROUGHOUT THE BOS

- SOF

MISSION AREA RELEVANT IN SEVERAL BOS AT HIGHER LEVELS

CONDITIONS

- NBC
- NIGHT

CONDITIONS OF THE BATTLEFIELD OPERATING ENVIRONMENT AFFECTING ALL BOS

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BATTLEFIELD OPERATING SYSTEMS (BOS)

(NOTIONAL)

	MANEUVER	INTEL	C^2	FIRE SPT	AIR DEF	MOB & SURV	CSS
CO	X			X			
TF	X	X		X	X		X
BDE	X	X	X	X	X	X	X
DIV	X	X	X	X	X	X	X
CORPS	X	X	X	X	X	X	X

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ODCSOPS

INTEGRATION OF BATTLEFIELD OPERATING SYSTEMS

COMPANY

- MANEUVER - 3 INF PLTS
- FIRE SPT - MORTARS & DS ARTY

KOREA - APRIL 1951
KAPYONG

CO. A 72ND HVY TK BN (US), ATTACHED TO 3RD RAR AND 2ND BN PRINCESS PATRICIA LIGHT INFANTRY (CA) HALTED MAJOR OFFENSIVE (SPRING 1951)

HISTORY OF THE CANADIAN FORCES IN KOREA

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ODCSOPS

INTEGRATION OF BATTLEFIELD OPERATING SYSTEMS

TASK FORCE

- MANEUVER - INF & AR TMS
- FIRE SUPPORT - ARTY BATTERY (DS)
- INTELLIGENCE - SCOUTS
- AIR DEFENSE - REDEYE

VIETNAM 1965-1966

1ST BN ROYAL AUSTRALIAN REGT & 161 NEW ZEALAND 105 ARTY BATTERY ATTACHED TO 173RD ABN BDE (US) CONDUCTED OPERATIONS THROUGHOUT III CORPS TACTICAL ZONE

ALLIED PARTICIPATION IN VIETNAM STUDY

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INTEGRATION OF BATTLEFIELD OPERATING SYSTEMS

BRIGADE

- MANEUVER - INF & AR TF
- FIRE SPT - ARTY BN (DS)
- INTELLIGENCE - SCOUT PLT
- AIR DEFENSE - REDEYE
- MOB & SURV - ENGR CO (DS)
- CSS - BDE SPT AREA
- C^2 - COMMO SECT

KISKA - 15 AUG 1943

CANADIAN 13TH INFANTRY BRIGADE GROUP ATTACHED TO 7TH ID (US) RECAPTURED KISKA ISLAND FROM THE JAPANESE

DEFENDING THE UNITED STATES AND ITS OUTPOSTS - OFFICIAL MILITARY HISTORY WWII

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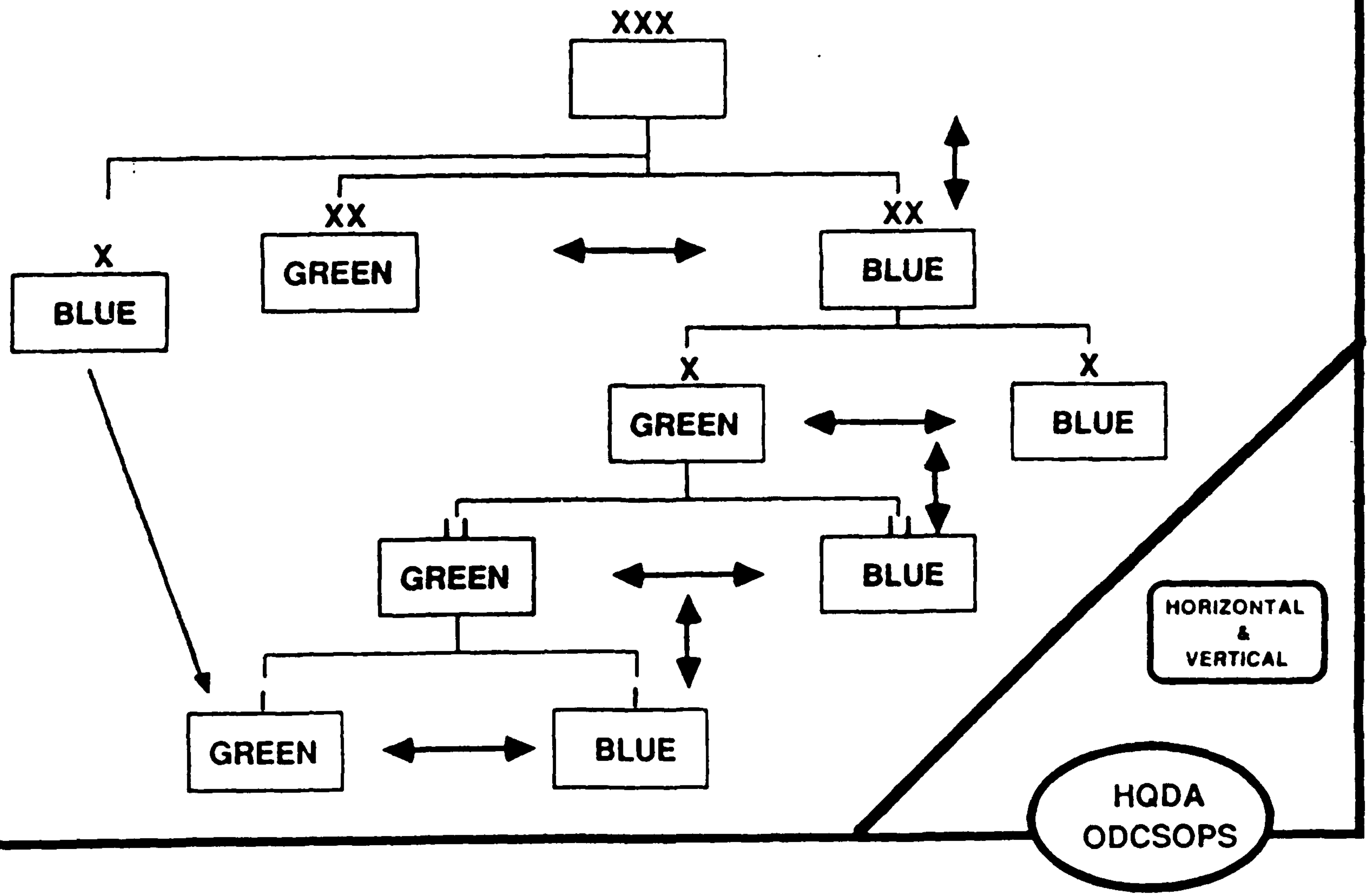
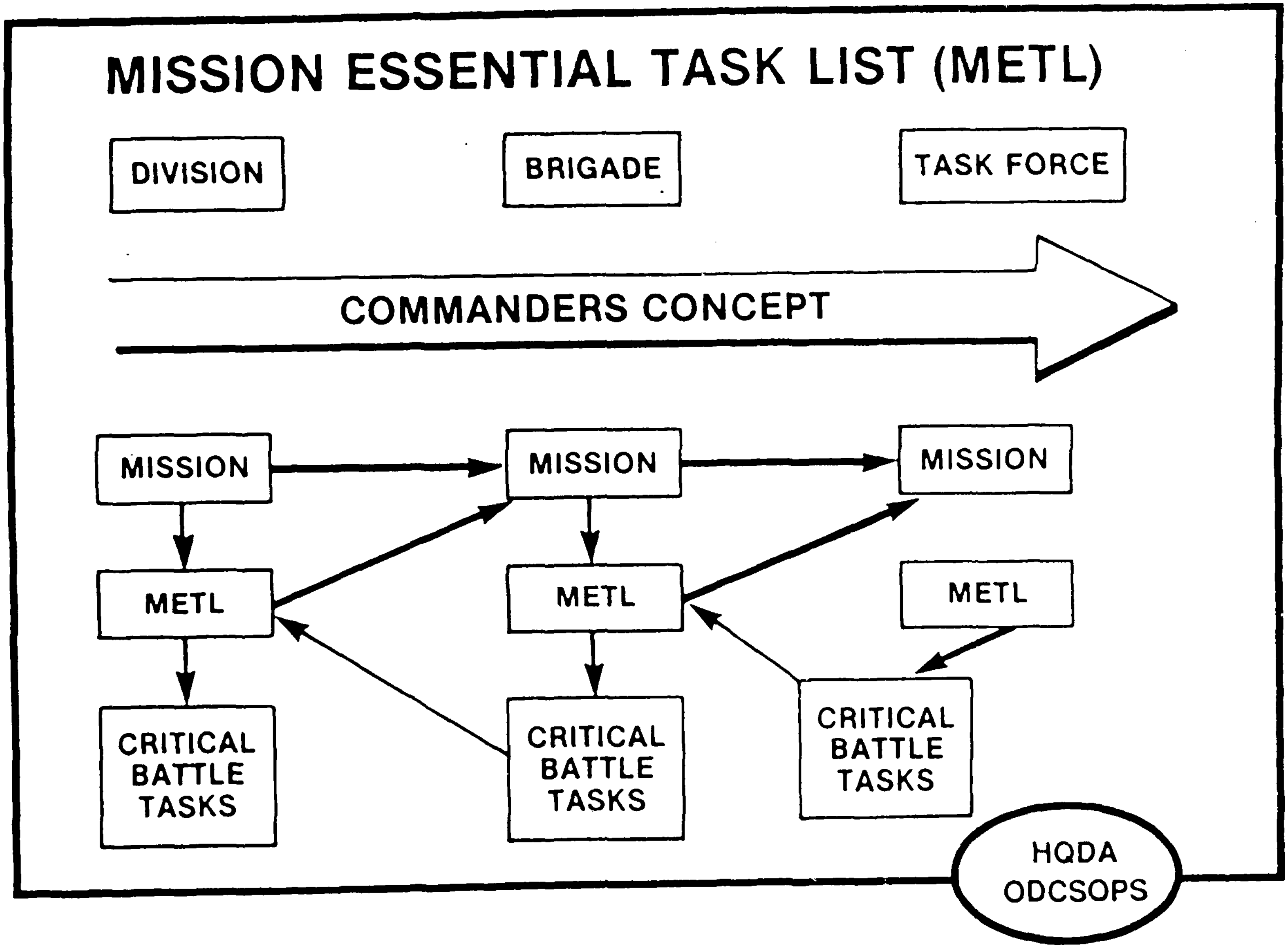
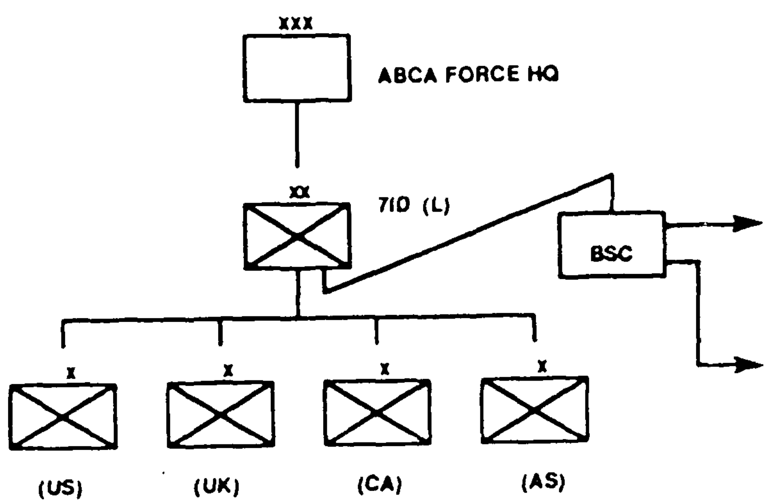
INTEROPERABILITY BOUNDARIES





MISSION ESSENTIAL TASK LIST (METL)
DIVISION
BRIGADE
TASK FORCE
COMMANDERS CONCEPT
MISSION
MISSION
MISSION
METL
METL
METL
CRITICAL BATTLE TASKS
CRITICAL BATTLE TASKS
CRITICAL BATTLE TASKS
HQDA ODCSOPS

BATTLEFIELD OPERATING SYSTEMS
(CALTROP TYRO)



	MANEUVER	INTEL	C^2	FIRE SPT	AIR DEF	MOB & SURV	CSS
CO	X			X			
TF	X			X	X		
BDE	X	X	X	X	X	X	X
DIV	X	X	X	X	X	X	X
CORPS	X	X			X	X	X

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ODCSOPS

MISSIONS

DIVISION

7ID (L) DEPLOYS 090600 NOV 87 TO HUNTER-LIGGETT PROVINCE, MONTEREY, ESTABLISHES A LODGEMENT, AND OCCUPIES ASSIGNED TAOR'S TO LOCATE AND DESTROY GUERRILLA FORCES.

BRIGADE

6 BDE (AS) OCCUPY TAA KOALA, MOVE BY WHEEL AND HELICOPTER TO TAOR, DESTROY UNCONVENTIONAL WARFARE AND GUERRILLA FORCES IN TAOR.

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BATTLEFIELD OPERATING SYSTEMS & MISSION ESSENTIAL TASK LIST (METL)

	MANEUVER	INTEL	C^3	FIRE SPT	AIR DEF	MOB & SURV	CSS
CO	X			X			
TF	X			X	X		
BDE	X	X	X	X	X	X	X
DIV	X		X		X		X
CORPS	X	X			X		

- CONDUCT PASSAGE OF LINES
- DISPLACE AS PART OF TF
- DEST GUERRILLA BASE
- PROTECT LOC'S
- DEST BRIDGE

- PLAN & EXECUTE FIRES DURING MVMT
- ENGAGE TGTS OF OPPORTUNITY
- PLAN & EXECUTE FIRES FOR ATTK ON GUERRILLA BASES
- PLAN FIRES TO INTERDICT LOC'S
- INTEGRATE & COORD CAS, NGF, & ATTK HELO

- RESUPPLY CL I/III/IV
- EVACUATE WOUNDED
- RECOVER DAMAGED EQUIPMENT
- REFIT FOR FUTURE OPNS

NIGHT?
NBC?

HQDA
ODCSOPS

BATTLEFIELD OPERATING SYSTEMS & MISSION ESSENTIAL TASK LIST (METL)

	MANEUVER	INTEL	C^3	FIRE SPT	AIR DEF	MOB & SURV	CSS
CO	X			X			
TF	X			X	X		
BDE	X	X	X	X	X	X	X
DIV	X		X		X		X
CORPS	X	X			X		

METL

- CONDUCT PASSAGE OF LINES
- OCCUPY TAA
- CONDUCT MVMT TO TAOR
- LOCATE & DESTROY GUERRILLA BASES
- PROTECT TRANSPORT ROUTES
- SEVER GUERRILLA LOC'S
- SUSTAIN COMBAT OPNS

CRITICAL BATTLE TASKS

- ESTABLISH LIAISON
- EXCHANGE FIRE PLANS
- RECEIVE CURRENT INTEL UPDATE
- EXCHANGE CEOI'S
- COORDINATE ROUTES/PASSAGE POINTS

HQDA ODCSOPS

BATTLEFIELD OPERATING SYSTEMS & MISSION ESSENTIAL TASK LIST (METL)

	MANEUVER	INTEL	C^2	FIRE SPT	AIR DEF	MOB & SURV	CSS
CO	X			X			
TF	X			X	X		
BDE	X	X	X	X	X	X	X
DIV	X		X		X		X
CORPS	X	X			X		

METL

- CONDUCT PASSAGE OF LINES
- OCCUPY TF SECTOR OF TAA
- DISPLACE TF TO TAOR
- DEST GUERRILLA BASES IN AO
- PROTECT TRANSPORT ROUTES
- SEVER GUERRILLA LOC'S IN AO

CRITICAL BATTLE TASKS

- CONVEY CONCEPT OF OPN TO STATIONARY UNIT
- COORD MVMT TO FORWARD AREA (ROUTES, FIRE SUPPORT, TRAFFIC CONTROL, RECOGNITION SIGNS)
- RECEIVE LOCAL INTEL UPDATE

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ODCSOPS

BATTLEFIELD OPERATING SYSTEMS & MISSION ESSENTIAL TASK LIST (METL)

	MANEUVER	INTEL	C^2	FIRE SPT	AIR DEF	MOB & SURV	CSS
CO	X			X			
TF	X			X	X		
BDE	X	X	X	X	X	X	X
DIV	X		X		X		X
CORPS	X	X			X		

METL

- CONDUCT PASSAGE OF LINES
- DISPLACE TO TAOR AS PART OF TF
- DESTROY GUERRILLA BASE
- SECURE LOC'S
- DESTROY BRIDGE

CRITICAL BATTLE TASKS

- DISPATCH GUIDES TO DESIGNATED PASSAGE PTS
- RECON CO ROUTES AND PASSAGE PTS
- RECEIVE LAST MINUTE INTEL AT PASSAGE PTS
- EXCHANGE CALL SIGNS AND FREQUENCIES
- CONDUCT PASSAGE

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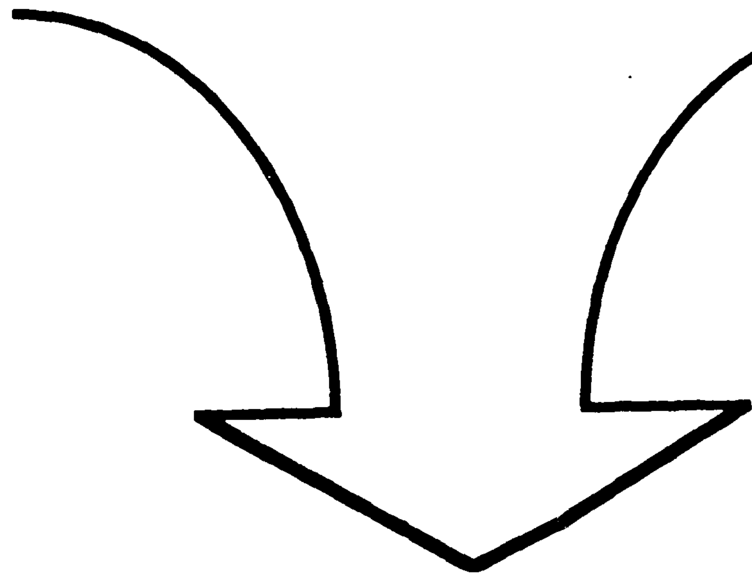
BOTTOM LINE



INTEROPERABILITY . . . A COMBAT MULTIPLIER

HQDA
ODCSOPS

Barbara Boykin
AIA

1

VOLUNTARY INTERNATIONAL STANDARDIZATION

-- WHY SHOULD DoD CARE?

INTERNATIONAL STANDARDS DO HAVE IMPACT

- INCREASINGLY GLOBAL ENVIRONMENT
  - Impact on U.S. trade & defense industrial base
  - Impact on DoD buying
- IMPACT ON DoD/NATO STANDARDS
- REQUIRED BY USG & DoD POLICIES

2

AIA MEMBER COMPANIES

Boeing
General Dynamics
General Electric
GM - Hughes Aircraft
Grumman
Honeywell
IBM Systems
    Integration Division
Lockheed
LTV

Martin Marietta
McDonnell Douglas
Northrop
Raytheon
Rockwell International
TRW
United Technologies
Westinghouse
Etc.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

1946	FOUNDED
HQ	GENEVA
72	MEMBERS
166	TC's
7000	STANDARDS

ACOUSTICS to ZINC

INTERNATIONAL ELECTROTECHNICAL COMMISION

1906	FOUNDED
HQ	GENEVA
44	MEMBERS
82	TC's
2000	STANDARDS

ELECTRICAL & ELECTRONIC

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

The U.S. Aerospace Industry and the Trend Toward Internationalization

5

A NEW ENVIRONMENT FOR INDUSTRY

- " INTERNATIONALIZATION " OF MARKETPLACE
- STRONGER FOREIGN COMPETITION
- TWO - WAY STREET IN PROCUREMENT
- RISE OF REGIONAL CONSORTIA
- MORE JOINT VENTURES

6

CHANGING DoD ACQUISITION ENVIRONMENT

- MORE FOREIGN DESIGNED/PRODUCED EQUIPMENT
  - NATO RSI
  - JOINT VENTURES

- MORE FOREIGN PARTS ENTERING DoD SUPPLY SYSTEM
  - METRIC READINESS

7

A NEW STANDARDS ENVIRONMENT

- U.S. STANDARDS FACING INCREASED COMPETITION
- NEED FOR HARMONIZATION
- POTENTIAL TECHNICAL BARRIERS TO TRADE

8

aerospace research center

AIA

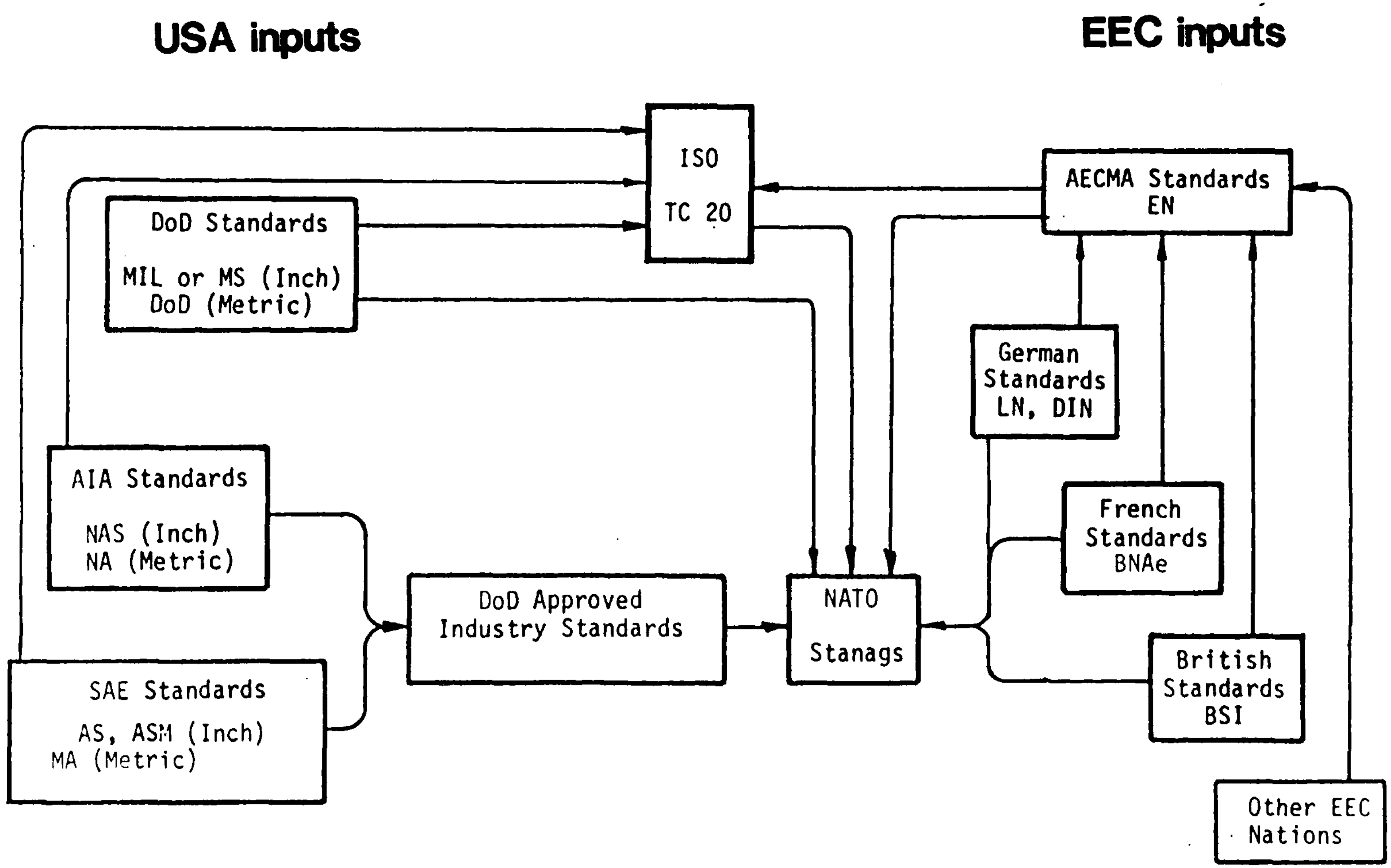
IMPACT OF INTERNATIONAL STANDARDIZATION TRENDS

On the U.S. Aerospace Industry

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

9

PRIMARY SOURCES FOR INTERNATIONAL AEROSPACE STANDARDS



10

EUROPEAN COMMUNITY'S SINGLE INTERNAL MARKET

11

STANDARDS POLICIES

- GATT STANDARDS CODE
- OMB A-119
- DODI 4120.20
- DODD 4120.18
- MIL-STD-970

12

SDI METRIC POLICY

"All newly designed, developed, and produced sytems and elements that make up the strategic defense system (SDS) shall use SI metric units. . ."

MIL-STD-970 -- STANDARDS AND SPECIFICATIONS, ORDER OF PREFERENCE

GROUP I: LAW OR REGULATION MANDATORY
. . . includes stds or specs which implement multinational treaty organization stzn. agreements, i.e., NATO STANAG's

GROUP II: NATIONAL & INTERNATIONAL NON-GOVERNMENT STANDARDS

GROUP III: FED SPECS & STANDARDS

GROUP IV: MIL SPECS & STANDARDS

HOW CAN DoD GET INVOLVED?

SOME ISO TC's OF DoD INTEREST

JTC 1 - INFORMATION TECHNOLOGY

TC 1 - SCREW THREADS

TC 4 - ROLLING BEARINGS

TC 8 - SHIPBUILDING

TC 10 - TECHNICAL DRAWINGS

TC 17 - STEEL

TC 20 - AIRCRAFT & SPACE VEHICLES

TC 22 - ROAD VEHICLES

TC 28 - PETROLEUM PRODUCTS & LUBRICANTS

TC 44 - WELDING

TC 59 - BUILDING CONSTRUCTION

TC 61 - PLASTICS

TC 79 - LIGHT METALS & ALLOYS

TC 85 - NUCLEAR ENERGY

TC 131 - FLUID POWER SYSTEMS

TC 135 - NON-DESTRUCTIVE TESTING

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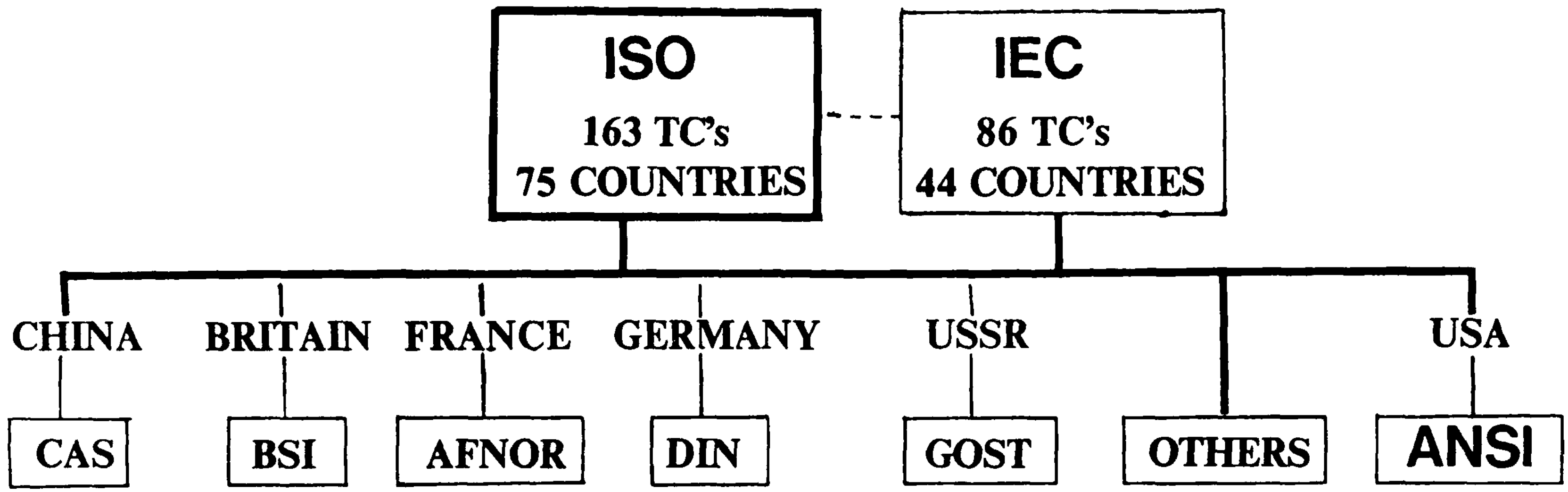
ISO MEMBER BODIES



PROBLEM AREAS

APPLICATION

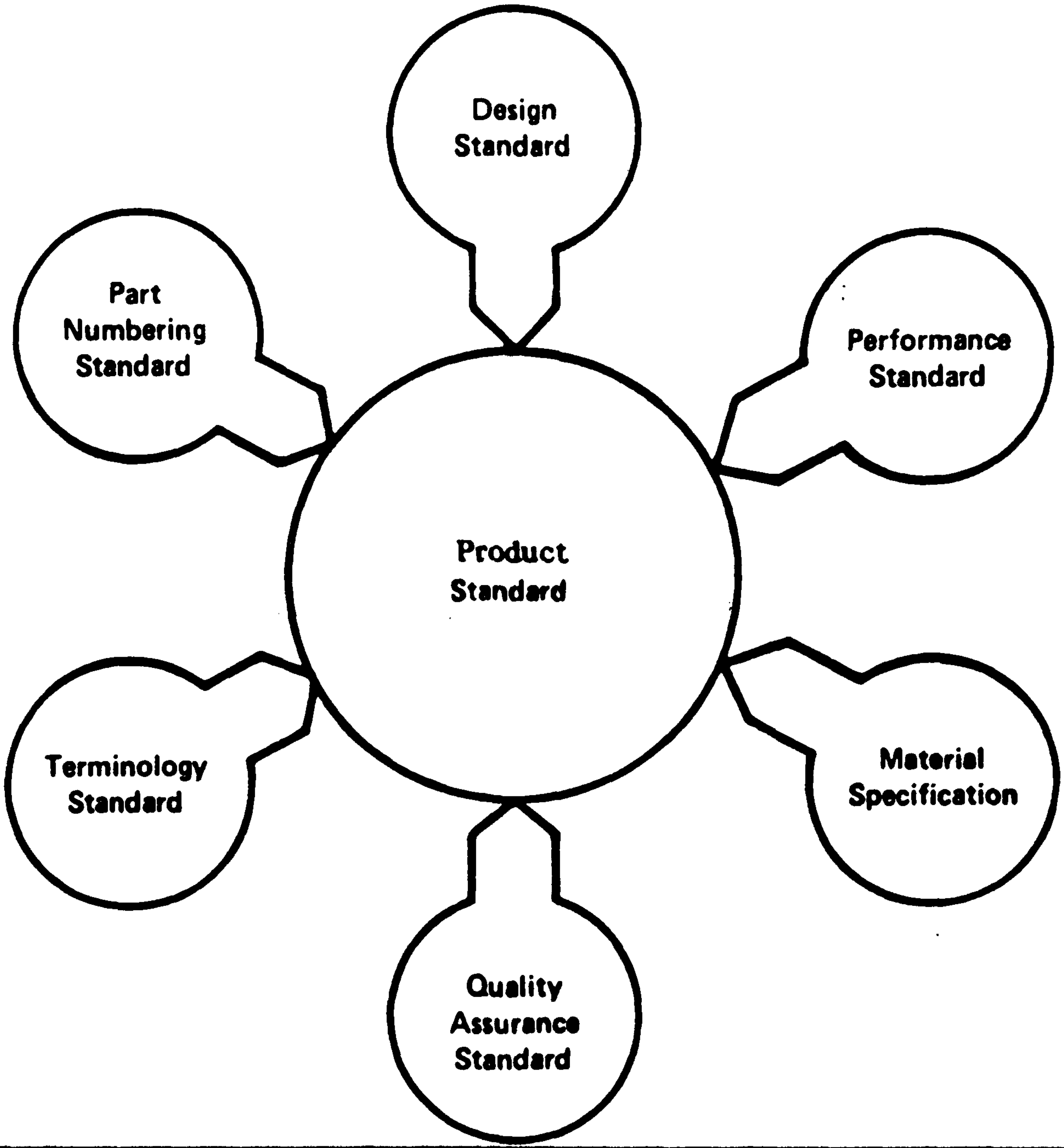
- AVAILABILITY & VISIBILITY
- INCOMPLETE COVERAGE
- BARRIERS TO FULL INTERCHANGEABILITY
- METRICATION

PARTICIPATION

- INDUSTRY/GOVERNMENT
- U.S. LEADERSHIP

8

THE BUILDING BLOCK APPROACH



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WHY PARTICIPATE?

CHALLENGE TO U.S. STANDARDS LEAD

- Preference to international standards
- Strength of European BLOC
- Potential technical trade barriers

FUTURE STANDARDIZATION/HARMONIZATION NEEDS

- NATO RSI
- Joint ventures & co-production
- Foreign parts creeping into U.S. system
- Metric readiness

REMEMBER . . .

IS ARE COMING -- WITH OR WITHOUT **US**

21

William Brittain
Canada

USE OF INTERNATIONAL AGREEMENTS IN THE ACQUISITION PROCESS
A CANADIAN PERSPECTIVE

GOOD MORNING LADIES & GENTLEMEN

AS YOU HEARD I AM BILL BRITTAIN AND I HEAD A SECTION RESPONSIBLE FOR ENGINEERING AND MAINTENANCE STANDARDIZATION AT OUR NATIONAL DEFENCE HQ IN OTTAWA. IN ADDITION TO THE NATO AND ABCA ACTIVITIES MY SECTION IS RESPONSIBLE FOR STANDARDIZATION POLICY AND THE PRODUCT QUALIFICATION PROGRAM FOR NATIONAL DEFENCE.

SAM MILLER ASKED ME TO SPEAK AT THIS CONFERENCE BECAUSE OF OUR ASSOCIATION IN THE NATO AC/301 FORUM AND BECAUSE IN THAT FORUM, THERE HAVE BEEN SEVERAL DISCUSSIONS REGARDING THE USE OF STANDARDIZATION AGREEMENTS INCLUDING STANAGs, QSTAGs AND OTHERS, IN THE ACQUISITION PROCESS. DURING THOSE DISCUSSIONS IT WAS OBVIOUS THAT DIFFERENT NATIONS HAD DIFFERENT POLICIES. IT APPEARS THAT CANADIAN POLICY IS THE OPPOSITE OF US POLICY. I AM HERE TO GIVE YOU A BRIEF DESCRIPTION OF THE CANADIAN SYSTEM OF SPECIFICATIONS AND STANDARDS AND IN PARTICULAR OUR USE OF INTERNATIONAL AGREEMENTS IN THE ACQUISITION PROCESS. PLEASE NOTE THAT MY COMMENTS ON INTERNATIONAL AGREEMENTS DO NOT INCLUDE OPERATIONAL PROCEDURES AGREEMENTS BUT ARE RESTRICTED TO MATERIEL AND ENGINEERING PRACTICES TYPE OF AGREEMENTS.

OUR GENERAL POLICY IN THE USE OF SPECIFICATIONS AND STANDARDS IN PROCUREMENT DOCUMENTS IS SHOWN HERE:

"WE WILL MAKE MAXIMUM USE OF INTERNATIONAL AND NATIONAL SPECIFICATIONS AND STANDARDS WHENEVER THEY FULFILL OUR REQUIREMENTS."

IT SHOULD BE NOTED THAT STANDARDIZATION AGREEMENTS ARE CONSIDERED INTERNATIONAL STANDARDS.

IT IS ALSO OUR POLICY TO WRITE OUR OWN SPECIFICATIONS AND STANDARDS ONLY IN THOSE CASES WHERE A SUITABLE SPECIFICATION OR STANDARD DOES NOT EXIST.

IN ADDITION, THE ORDER OF PRIORITY FOR THE USE OF SPECIFICATIONS AND STANDARDS ARE AS SHOWN HERE:

1. INTERNATIONAL INCLUDING ISO, STANAGs. QSTAGs

2. NATIONAL INCLUDING CANADIAN STANDARDS ASSOCIATION (CSA) CGSB, ANSI, BSI

3. GOVERNMENT INCLUDING DND DOCUMENTS, MIL SPECS, DEF STANS, ETC.

4. INDUSTRIAL

THESE POLICIES ARE IMPLEMENTED THROUGH OUR HEADQUARTERS ENGINEERING STAFF WHO ARE RESPONSIBLE FOR STATING THE TECHNICAL REQUIREMENTS OF OUR PROCUREMENT DOCUMENTATION. THE ORGANIZATION OF THIS STAFF IS SHOWN IN THESE TWO SLIDES. IT SHOULD BE NOTED THAT FOR MANY OF THE LARGER PROJECTS A PROGRAM MANAGEMENT OFFICE MAY BE ESTABLISHED TO PROVIDE OVERALL PROJECT MANAGEMENT.

IT IS THIS SAME ENGINEERING STAFF WHO PARTICIPATE IN THE DEVELOPMENT OF THE TECHNICAL INTERNATIONAL AGREEMENTS OF NATO AND ABCA, IN THEIR AREAS OF EXPERTISE. AS A RESULT THEY ARE NORMALLY WELL AWARE OF THE APPLICABLE AGREEMENTS WITHIN THEIR AREA OF EXPERTISE AND WHETHER THOSE AGREEMENTS ARE APPROPRIATE FOR USE IN A PARTICULAR CONTRACT. IN ADDITION, MY SECTION MAINTAINS AN INDEX OF INTERNATIONAL AGREEMENTS WHICH IS MADE AVAILABLE TO ALL TECHNICAL STAFF. THE INDEX INCLUDES A PARTIAL CROSS-REFERENCE AND KEYWORD INDEX FOR EASIER USE.

TO COMPLETE THE LOOP THERE IS AN OFFICE WITHIN OUR HEADQUARTERS TO STAFF REQUESTS FROM INDUSTRY FOR ANY DOCUMENTS WHICH MIGHT BE REFERENCED IN RFPs OR CONTRACTS. RELEASE TO INDUSTRY IS ON A CASE-BY-CASE BASIS ALTHOUGH A NEW SECTION IS BEING PROPOSED FOR QSTAGs INDICATING WHETHER THEY ARE RELEASABLE TO INDUSTRY.

......./3

THERE ARE A COUPLE OF REASONS WHY THIS USE OF STANAGs IS IMPORTANT TO CANADA. FIRST, WE HAVE BEEN UNDER SOME CRITICISM REGARDING OUR SUPPORT OF NATO AND ITS ACTIVITIES AND WE SEE THIS AS ONE METHOD OF SHOWING OUR SUPPORT. SECONDLY, MORE AND MORE OF OUR PROCUREMENTS ARE OFFSHORE OF NORTH AMERICA AND MANY OF THE EUROPEAN MANUFACTURERS ARE VERY ATTUNED TO STANAGs, IN PARTICULAR.

IN IMPLEMENTING THESE POLICIES MANY DIFFICULTIES ARE ENCOUNTERED. AS I'M SURE YOU ALL RECOGNIZE MANY OF THE INTERNATIONAL STDS ARE NOT USABLE BY NATIONAL DEFENCE EITHER BY THEIR NATURE OF BEING CONSENSUS DOCUMENTS OR BECAUSE THE PRODUCTS/PROCESSES THEY DESCRIBE ARE NOT APPLICABLE TO DEFENSE. OUR DEPARTMENT RECEIVES MANY COMPLAINTS EVERY YEAR FROM ORGANIZATIONS COMPLAINING THAT ADHERENCE TO MIL TYPE SPECIFICATIONS IS EXPENSIVE AND UNNECESSARY BECAUSE OF THE STRINGENT CONDITIONS UNDER WHICH THE EQUIPMENT MUST OPERATE.

THERE ARE ADDITIONAL PROBLEMS IN THE USE OF INTERNATIONAL AGREEMENTS. IN MANY CASES THE AGREEMENTS ARE NOT APPROPRIATE AS CONTRACTUAL DOCUMENTS. OFTEN THE AGREEMENTS PROVIDE ONLY GUIDANCE IN THE DESIGN OF EQUIPMENT AND FURTHER DEFINITION IS OFTEN REQUIRED OR THE LANGUAGE OF THE DOCUMENT IS NOT OBLIGATORY AND THEREFORE MUST BE ADAPTED FOR USE.

ANOTHER PROBLEM WHICH EXISTS IS THE PROMULGATION OF THE AGREEMENTS THEMSELVES, THAT IS NOTIFYING ALL INTERESTED STAFF AN AGREEMENT DOES EXIST. AS I MENTIONED MY SECTION ISSUES AN INDEX OF AGREEMENTS HOWEVER THIS INDEX IS NOT OVERLY USED. THERE IS ALWAYS THE PROBLEM OF DISCEMINATING THE INFO ONCE IT IS AVAILABLE , SINCE, IN MANY CASES THE AGREEMENTS ARE OF INTEREST TO SEVERAL OFFICES AND ORGANIZATIONS. THIS INFORMATION IS NOT ALWAYS AVAILABLE TO ALL INTERESTED PARTIES.

DURING DEVELOPMENT OF ANY AGREEMENT NATIONS MUST ALSO ENSURE THAT THEY DO NOT CONTRADICT ESTABLISHED NATIONAL DOCUMENTATION OR PROCEDURES. AS A RESULT THE AGREEMENTS ARE OFTEN COMPROMISES OF SEVERAL NATIONS AND IN ORDER TO BE USED AS CONTRACTUAL DOCUMENTS THEY DO REQUIRE SOME AMENDMENTS IN ORDER TO BE ACCEPTABLE.

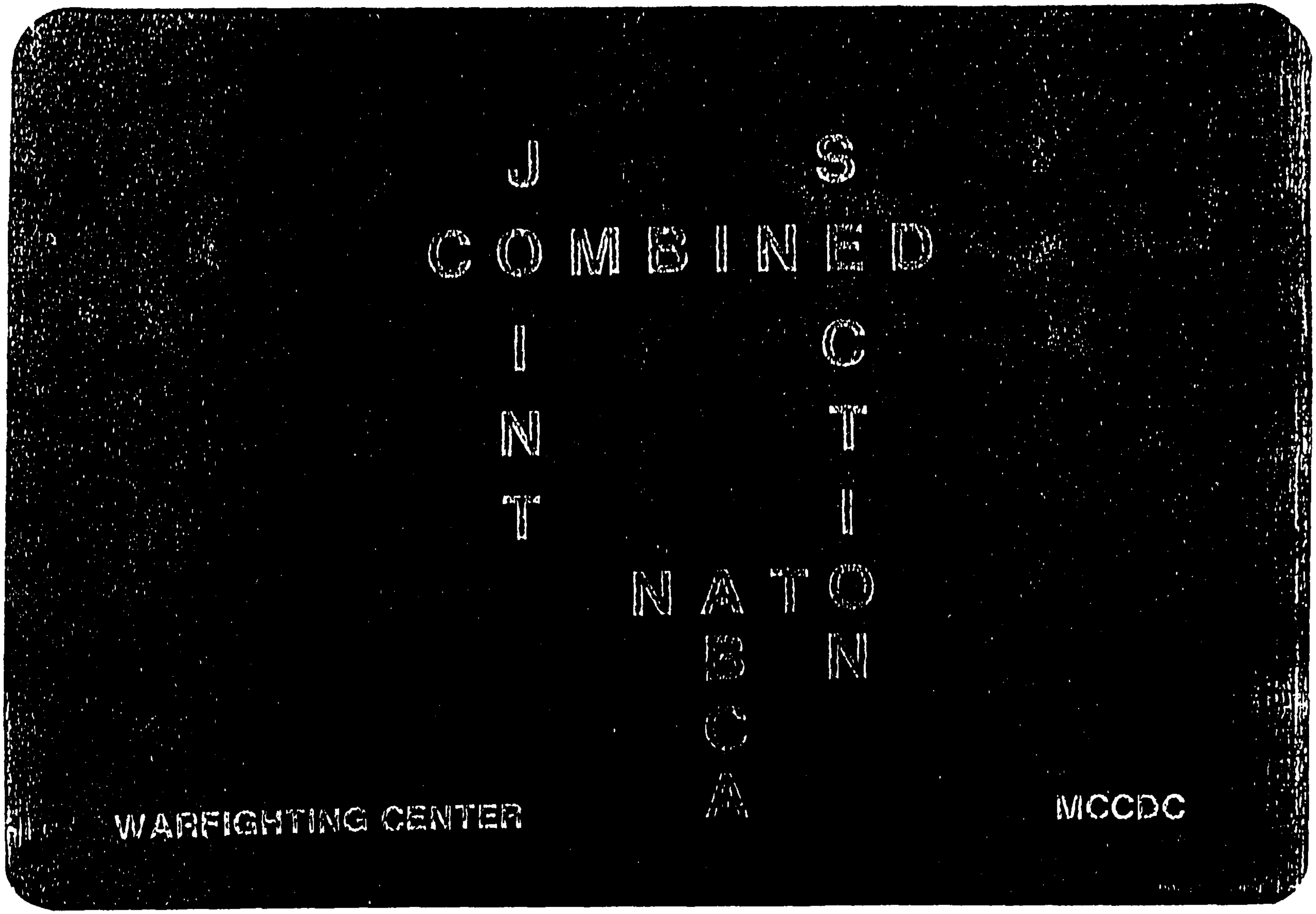
I'M SURE THESE PROBLEMS ARE SIMILAR TO MANY THAT YOU HAVE ALL ENCOUNTERED AT SOME POINT IN TIME IF YOU HAVE BEEN INVOLVED WITH THE DEVELOPMENT AND/OR IMPLEMENTATION OF INTERNATIONAL AGREEMENTS. CERTAINLY THESE PROBLEMS ARE ONES WHICH DECREASE THE NUMBER OF AGREEMENTS WHICH CAN BE USED AS CONTRACTUAL DOCUMENTS.

ANOTHER ISSUE THAT HAS BEEN IMPORTANT IN THE USE OF INTERNATIONAL AGREEMENTS IS VALIDATION, THAT IS THE DETERMINATION AS TO WHETHER AN AGREEMENT HAS BEEN IMPLEMENTED. ALTHOUGH OUR POLICY IS THAT CANADA NORMALLY WILL NOT RATIFY A DOCUMENT UNLESS WE PLAN TO IMPLEMENT IT, THERE ARE SEVERAL REASONS WHY THE IMPLEMENTATION MAY BE DELAYED. SINCE WE HAVE NO FORMAL VALIDATION PROCESS IT IS VERY DIFFICULT TO DETERMINE THE NUMBER OF AGREEMENTS WHICH HAVE BEEN IMPLEMENTED. THE SITUATION IS MADE MORE DIFFICULT BY THE FACT THAT WE USE THE AGREEMENTS AS THEY ARE; AND DO NOT INCLUDE THEM IN OUR OWN DOCUMENTATION. THIS MAKES THE TRACEABILITY DIFFICULT OVER TIME, PARTICULARLY WHEN THERE IS A CONSTANT CHANGE IN PERSONNEL AS IS THE CASE IN OUR DEPARTMENT.

AS A RESULT OF THESE ISSUES IT IS DIFFICULT TO GIVE AN ESTIMATE OF THE NUMBER OF INTERNATIONAL AGREEMENTS WHICH HAVE BEEN IMPLEMENTED THROUGH CONTRACTS OR THE NUMBER BEING REFERENCED IN CONTRACTS, HOWEVER, IT IS EXPECTED THE PERCENTAGE IS NOT HIGH.

IN CONCLUSION, CANADA DOES USE STANAGs AND OTHER INTERNATIONAL AGREEMENTS DIRECTLY IN PROCUREMENT DOCUMENTS IF THE AGREEMENT IS APPLIC-ABLE TO THAT PROCUREMENT. IT SHOULD BE RECOGNIZED THAT OUR SYSTEM IS MUCH SMALLER THAN YOURS, SO THE STAFFING AND CO-ORDINATION EFFORTS ARE NOT SO HORRENDOUS. ON THE OTHER HAND, I HAVE NOT DESCRIBED ALL THE DETAILED EFFORTS AND PROBLEMS WHICH EVEN CANADA ENCOUNTERS, IN IMPLEMENTING THESE POLICIES.

LTC Ron Smith, USMC



MARINE CORPS PARTICIPATION IN INTERNATIONAL MILITARY STANDARDIZATION

OUTLINE

-- INTERNATIONAL STANDARDIZATION AGREEMENT (ISA) FRAMEWORK

-- USMC WITHIN ISA FRAMEWORK

  0 HQMC

  0 CG, MCCDC

-- COMBINED BRANCH, JC D

-- RATIFICATION PROCESS

ISA FRAMEWORK

- INTERNATIONAL
  - NATO
  - ABCA
- NATIONAL
  - JCS
  - ARMY, NAVY, AIR FORCE
  - USMC

<u>NATO</u>
MILITARY
COMMITTEE
(MC)

MILITARY AGENCY
FOR
STANDARDIZATION
(MAS)

ARMY BOARD	NAVY BOARD	AIR BOARD
17 WORKING PARTIES	11 WORKING PARTIES	20 WORKING PARTIES

U. S. DELEGATIONS

ABCA
ARMIES
TEAL

WASHINGTON
STANDARDIZATION
OFFICE
(WSO)

PRIMARY
STANDARDIZATION
OFFICE
(PSO)

NATIONAL STANDARDIZATION OFFICE US (NSO)	NATIONAL STANDARDIZATION OFFICE UK (NSO)	NATIONAL STANDARDIZATION OFFICE CAN (NSO)	NATIONAL STANDARDIZATION OFFICE AUS-NZ (NSO)

20
QUADRIPARTITE
WORKING GROUPS (QWG)

ABCA

(AIR & NAVAL QUADRIPARTITE STANDARDIZATION)

- AIR STANDARDIZATION COORDINATING COMMITTEE (ASCC)
  - FIELD Z

NATIONAL FRAMEWORK

NATO

	ARMY BOARD WP'S	NAVY BOARD WP'S	AIR BOARD WP'S
LEAD SERVICES PLAYER	USA USMC	USN USMC	USAF USMC

ABCA

	ARMIES	FIELD Z	ASCC
LEAD SERVICES PLAYER	USA USMC	USN USMC	USAF USMC

- NEW PLAYERS: JCS (J-7, RSI)
- ROLE EVOLVING

  O MOP 147

-- <u>CHAPTER (MISSION)</u> CG, MCCDC THROUGH THE WARFIGHTING CENTER <u>COORDINATES</u> USMC PARTICIPATION IN THE INTERNATIONAL DOCTRINE DEVELOPMENT PROCESS, WHICH CONSISTS OF SOME 85 STANDING INTERNATIONAL COMMITTEES (UNDER NATO, ABCA, ASCC) DEDICATED TO ADVANCING STANDARDIZATION AND INTEROPERABILITY.

-- <u>DIVISION OF RESPONSIBILITY</u>

--- HQMC

O CODE P EXERCISES OVERALL STAFF COGNIZANCE OF THE INTERNATIONAL STANDARDIZATION PROGRAM.

O COPE PL SERVES AS POC FOR:

OO REPRESENTING USMC ON INTERNATIONAL STANDARDS WORKED AT JCS/OSD

OO PROVIDING POLICY GUIDANCE

OO APPROVING ANNUAL PRIORITIZATION OF MEETINGS AND WP ATTENDANCE

OO COORDINATING WHEN POLICY ISSUES CROSS FUNCTIONAL LINES

--- CG, MCCDC

0 COORDINATE THE ADMINISTRATIVE ASPECTS OF THE INTERNATIONAL STANDARDIZATION (IS) PROGRAM

0 MONITORING REVIEW PROCESSES ASSOCIATED WITH IS AGREEMENTS

0 OBTAINING FINAL APPROVAL ON INTERNATIONAL STANDARDIZATION AGREEMENTS

0 MAINTAINING CLOSE COORDINATION WITH IS OFFICES - ARMY, NAVY AND AIR FORCE

0 PROVIDE THE "INSTITUTIONAL MEMORY" NECESSARY FOR SUCCESSFUL PARTICIPATION IN COMBINED DOCTRINE/INTERNATIONAL STANDARDIZATION

0 DETERMINE MARINE CORPS SUBSCRIPTION/DISTRIBUTION OF ALLIED PUBLICATIONS

T/O

SECTION HEAD COL 9907

AO, JOINT (GRD)	LTCOL	9911	AO, COMBINED (GRD)	LTCOL	9911
AO, JOINT (AVN)	MAJ	9912	AO, COMBINED (AVN)	MAJ	9912
TERMINOLOGY COORD	GS-11	0345	NATO COORD	GS-11	0345
			STANDARDIZATION SPECIALIST	GS-6	0344

--- TASKS

0 STAFF ISA/AP PROPOSALS/CHANGES WITHIN USMC

0 TAKE LEAD WITHIN DON FOR 2000 SERIES STANAGS

0 MONITOR REVIEW PROCESSES ASSOCIATED WITH INTERNATIONAL AGREEMENTS

0 MAINTAIN CLOSE COORDINATION WITH IS OFFICERS OF

00 NAVY	00 AIR FORCE
00 ARMY	00 JCS

TASKS CONTINUED:

- COORDINATE USMC PARTICIPATION AT WP/WG'S
- PREPARE BRIEF, DEBRIEF WP/WG DELEGATES
- MAINTAIN REPOSITORY OF IS DOCUMENTS
- PUBLISH MONTHLY SUMMARY OF IS DOCUMENTS RECEIVED
- BUDGET TAD FUNDS FOR MCCDC PARTICIPATION IN IS PROGRAM

--- <u>SCOPE (STATISTICS)</u>

0 DOCUMENTS MANAGED

00 STANAGS - 862 PUBLISHED
- 348 IN DRAFT STAGES

00 ALLIED PUBLICATIONS - 256

00 QSTAGS - 390 PUBLISHED
- 167 IN DRAFT STAGES

00 QAPS - 78

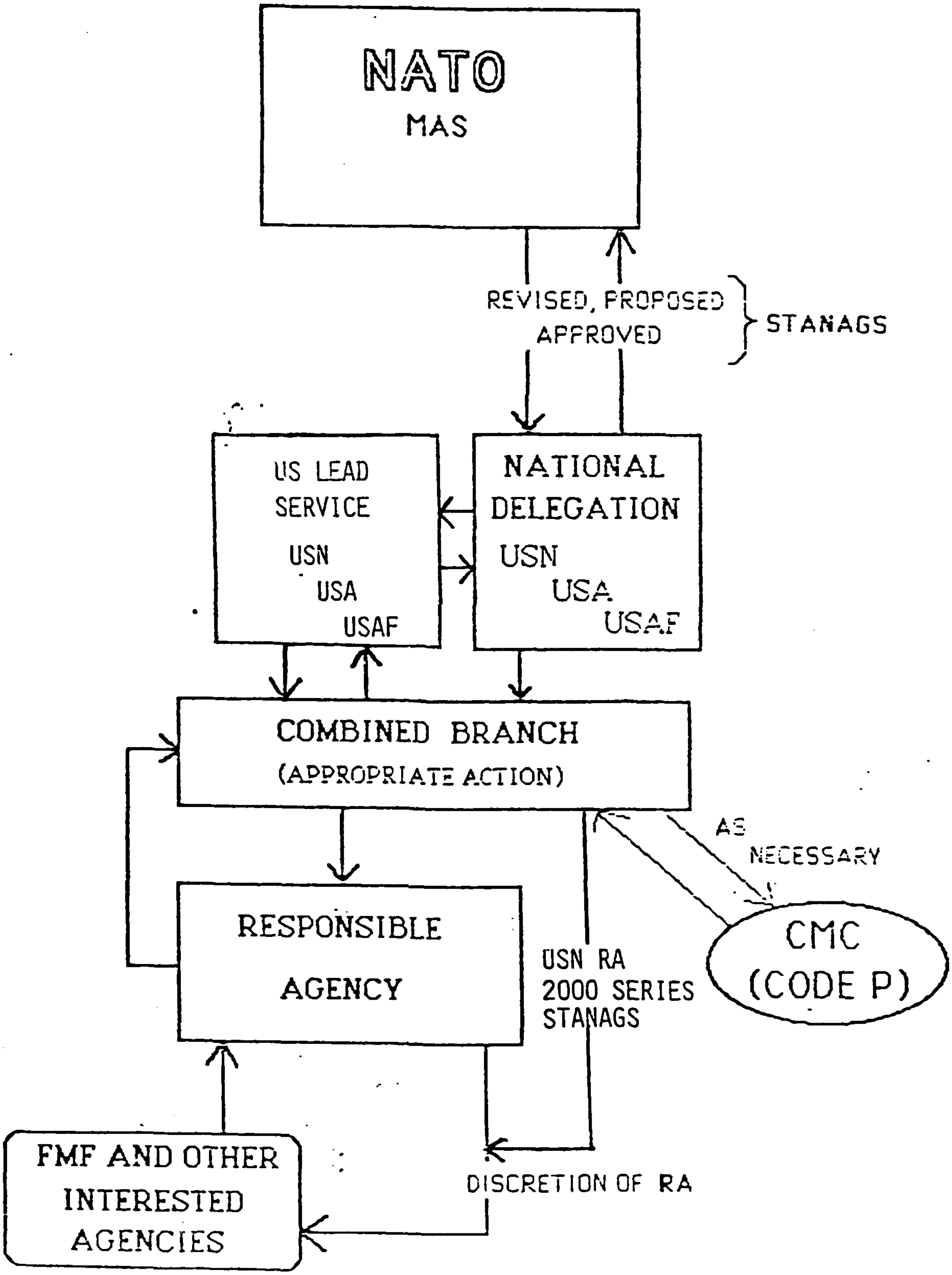
00 ASCC AGREEMENTS - 308 AIR STANDARDS
- 59 ADVISORY PUBLICATIONS
- 309 PROJECTS

00 WP/WG DOCUMENTS - 98

0 TOTAL - 2875

0 TRANSACTIONS PAST YEAR - IN EXCESS OF 2900

RATIFICATION PROCESS



SUMMARY

- ISA FRAMEWORK
  - 0 INTERNATIONAL
  - 0 NATIONAL
- USMC FRAMEWORK
  - 0 HQMC
  - 0 CG, MCCDC
    - 00 COMBINED BRANCH
- RATIFICATION PROCESS

BOTTOM LINE

THE MARINE CORPS INTENDS TO PLAY A MORE ACTIVE AND EFFECTIVE CONTRIBUTIONAL ROLE IN THE INTERNATIONAL ARENA.

QUESTIONS/DISCUSSION

Panel 4 - Session A–INTERNATIONAL STANDARDIZATION (RSI)

Panel Recommendations

Increase DoD/Industry technical expert participation in national standardization committees that support ISO and IEC.

Establish standard to provide uniform national certification/qualification systems for products and manufacturers.

Improve the national procedures for implementation of reciprocal multinational product qualification/certification.

Develop a NATO list of preferred materials for use in defense systems intended for multinational use.

Improve availability and distribution of information on DoD use of ISO, IEC, NATO, ABCA, and other international standardization documents.

Develop international interface standards for interchangeability of materials, parts and components produced by NATO national industries.

Develop catalogue on interchangeable materials, parts, and components used in U.S., CA, and other alliance nations.

Encourage use of common standards at the regional levels.

Direct more attention to developing operational standards to improve alliance forces interoperability.

Develop automated information bases for international standards under development and available for use.

Issue instruction to prevent use of international standards which have not been approved by the appropriate technical committee and policy officials.

Determine and report mission-essential data concerning standardization projects for NATO for use in justifying adequate operation budget support by military commands and DoD agencies.

1988 DOD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

PANEL 4 SESSION B

STREAMLINED SPECIFICATIONS--GENERATION AND APPLICATION

This panel will discuss the status of Acquisition Streamlining, including the status of the policy documents affecting the program (Handbook and FAR provisions); tie-in of Streamlining to the Total Quality Management Initiatives of Dr. Robert Costello, Under Secretary of Defense for Acquisition; the future direction of Streamlining in DoD and the expansion of training by Services and DoD of personnel in Acquisition Streamlining. The panel will also address how the format and content of standardization documents can affect Acquisition Streamlining.

CO-CHAIR: **Mr. Frank E. Doherty, Assistant for Acquisition Streamlining, IPQ, OASD(P&L) and Mr. Frederick (Tom) Stark, Manager, Aerospace Management Systems, McDonnell Douglas Corp., St. Louis, MO.**

PANELISTS: **Mr. James F. Bair, Technical Director, Support Systems Engineering, ASD, AFSC**
Ms. Eileen Foy, Supervisory Materials Engineer, NAEC
Mr. Anthony S. Laura, Manager, Engineering Design Operations, Boeing Aerospace Co., Seattle, WA

THE STREAMLINING/TOTAL QUALITY MANAGEMENT RELATIONSHIP

FRANK DOHERTY
OSD, DIRECTORATE
FOR INDUSTRIAL
PRODUCTIVITY AND
QUALITY

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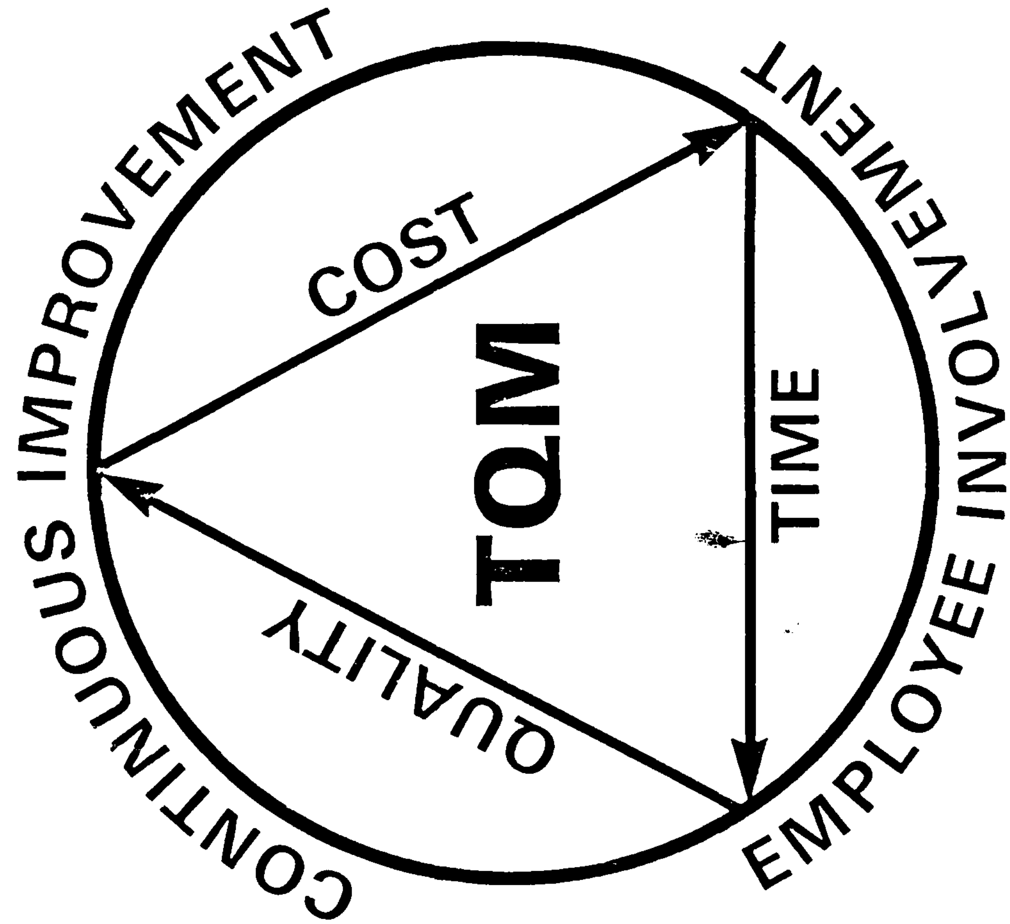


CONTINUOUS IMPROVEMENT
EMPLOYEE INVOLVEMENT
COST
TIME
QUALITY
TQM

TOTAL QUALITY MANAGEMENT (TQM)

ORGANIZED CONTINUOUS PROCESS IMPROVEMENT ACTIVITIES INVOLVING EVERYONE IN AN ORGANIZATION — MANAGERS AND WORKERS — IN A TOTALLY INTEGRATED EFFORT TOWARD IMPROVING PERFORMANCE AT EVERY LEVEL. THIS IMPROVED PERFORMANCE IS DIRECTED TOWARD SATISFYING SUCH CROSSFUNCTIONAL GOALS AS QUALITY, COST, SCHEDULE, MISSION NEED AND SUITABILITY. TOTAL QUALITY MANAGEMENT INTEGRATES FUNDAMENTAL MANAGEMENT TECHNIQUES, EXISTING IMPROVEMENT EFFORTS AND TECHNICAL TOOLS UNDER A DISCIPLINED APPROACH FOCUSED ON CONTINUOUS PROCESS IMPROVEMENT. THESE ACTIVITIES ARE ULTIMATELY FOCUSED ON INCREASED CUSTOMER/USER SATISFACTION

8 527:

DEFINITIONS

QUALITY:

OLD: CONFORMANCE TO REQUIREMENTS

NEW: CONFORMANCE TO CORRECTLY DEFINED REQUIREMENTS SATISFYING USER NEEDS

THE USER WANTS PRODUCTS AND SERVICES THAT THROUGHOUT THEIR LIFE, MEET USER NEEDS AND EXPECTATIONS AT A COST THAT REPRESENTS VALUE

TQM IS A PROCESS NOT A PROGRAM

* Everything involves a process. Prevention and improvement must address processes, not products.

* TQM improves processes.

* Essential success factors:

    Enabling continuous growth in peoples' understanding of their processes.

    Ensuring improvement efforts are properly focused.

    Providing sufficient flexibility to improve the process. (Streamlining is a key tool.)

    Top management involvement.

MAJOR TQM PROCESS ELEMENTS

- Phased cultural deployment
- Top management commitment
- Flexibility to change requirements and to improve processes
- Dedicated and knowledgeable facilitators
- Intensive training program
- Integrated teaming structures
- Structured and disciplined process improvement methodology
- Customer involvement
- Vendor involvement

TQM IMPLEMENTATION

POLICY: As defined in SECDEF Memorandum of 30 March 1988

- USD(A) to implement TQM by making it an "integral element of the entire acquisition process."

- Develop policies and seek appropriate changes to FAR and other regulations to "ensure that TQM is enforced in requirements formulation, design, development, production planning, solicitation and source selection, manufacturing, fielding, and support."

TQM IMPLEMENTATION

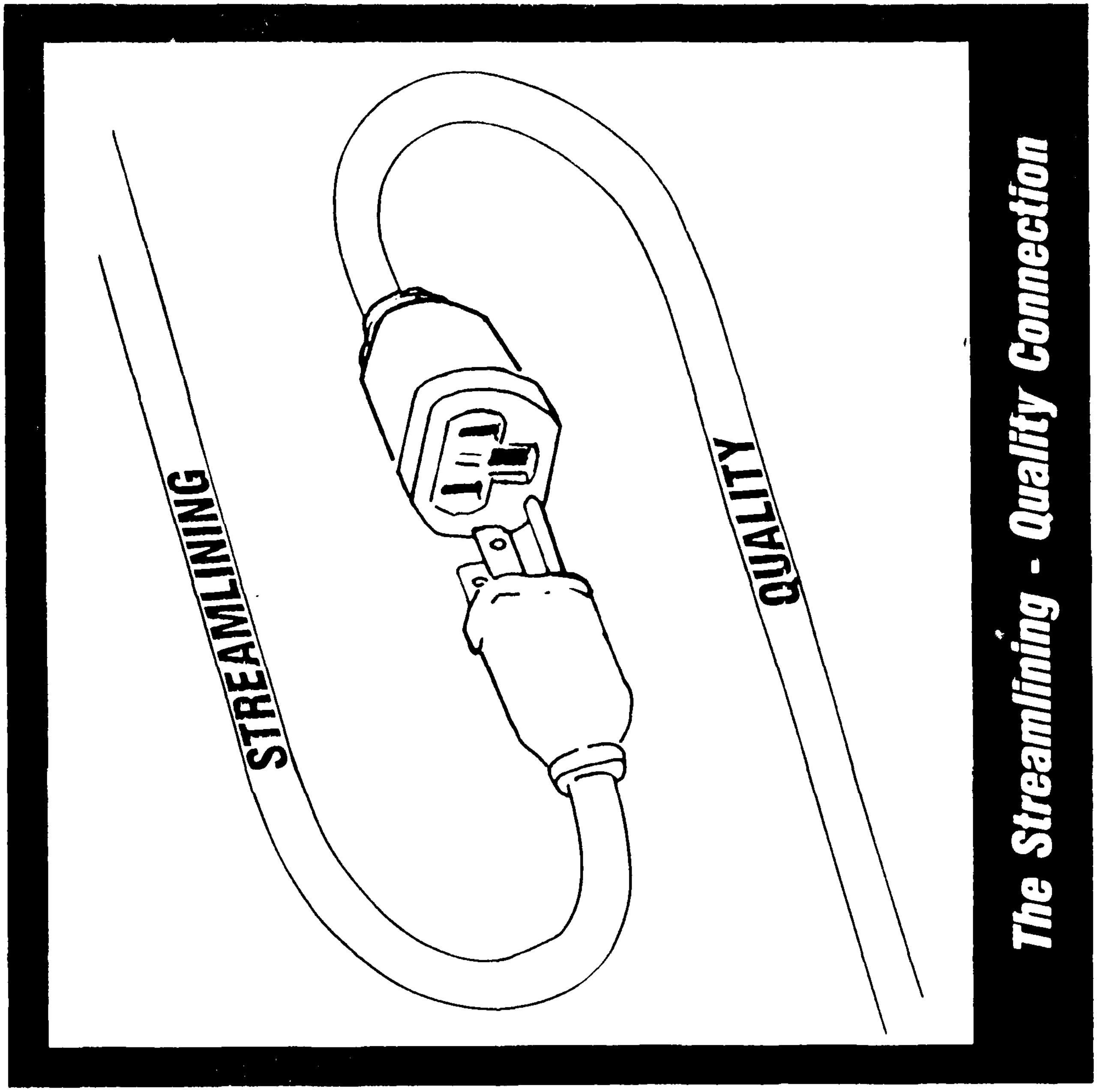
POLICY: As defined in USD (A) Memorandum of 19 August 1988.

--By implementing TQM, and coupling it with the intensified application of Acquisition Streamlining and other value added strategies, we can achieve unprecedented improvements in the effectiveness of the DoD acquisition process.

--We will link TQM to the weapon system acquisition process to ensure that it is properly considered in acquisition strategy development and effectively implemented during contract execution.

TWO VIEWS OF QUALITY

TRADITIONAL VIEW	CURRENT POSTURE
• Productivity and quality are conflicting goals.	• Productivity gains are achieved through quality improvements.
• Quality defined as conformance to specifications or standards.	• Quality is correctly defined requirements satisfying user needs.
• Quality measured by degree of nonconformance.	• Quality is measured by continuous process/product improvement and user satisfaction.
• Quality is achieved through intensive product inspection.	• Quality is determined by product design and is achieved by effective process controls.
• Some defects are allowed if product meets minimum quality standards.	• Defects are prevented through processes control techniques.
• Quality is a separate function and focused on evaluating production.	• Quality is a part of every function in all phases of the product life cycle.
• Workers are blamed for poor quality.	• Management is responsible for quality.
• Supplier relationships are short termed and cost oriented.	• Supplier relationships are long term and quality oriented.



The Streamlining - Quality Connection

Summary
Acquisition Streamlining Panel

The following is an overview of the principle conclusions from the Acquisition Streamlining panel:

Acquisition Streamlining is a fundamental underpinning of the Total Quality Management (TQM) concept. Streamlining is essential to TQM because it provides the flexibility for industry to recommend changes to specifications, standards, data requirements, the statement of work, and other requirements of the contract which will result in improvement to processes, which is the key to TQM.

Acquisition Streamlining is slowly becoming an accepted way of doing business in defense acquisition. The panel provided relevant examples of progress in this regard:

Eileen Foy, NAEC, Lakehurst, NJ, presented a methodology for implementing the Streamlining approach in the development of specifications and standards.

Jim Baird, ASD, WPAFB, OH, emphasized the need to rely on performance requirements, in lieu of detailed "How To" specifications and standards in the early phases of acquisition. The benefits of guide specifications such as Air Force's MIL PRIME documents and maximum contractor involvement in recommending detailed specifications and standards and their application and tailoring, as a product of the design phase, was also stressed.

Stan Laura, Boeing Aerospace Co., provided an example of successful Streamlining on the Sea Lance Program, and the importance to the program manager of a viable program.

Tom Stark, McDonnell-Douglas Corp., pointed out that it did not appear that the DoD Directive on Streamlining was being followed in many current Streamlining applications with regard to the requirement not to invoke specifications early in the development cycle. Long term outlook for Streamlining appeared very positive, particularly as Streamlining is included in the Federal Acquisition Regulation:

FAD/DFAR provisions for Streamlining are being published--FAC 84-39 & DAC 88-1.

The DoD Streamlining Handbook will be published shortly--NAEC, Lakehurst, is incorporating final Service and Industry comments.

A DoD-Industry Streamlining conference will be held in Washington, DC, on May 31-June 1, 1989.

1988

DoD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

SUMMARY OF RECOMMENDATIONS

1988 DoD Standardization and Data Management Conference Panel Recommendations

Responsible Office

Panel 1 - Session A- Defense Acquisition Board Process

Recommendation:	Responsible Office
Work to fully implement acquisition chain and simplify process:	
-Reduce external staff influences/briefings	Service Acquisition Execs
-Review OSD Committee Membership	OUSD(A)/PI/Comm. Chrmn.
-Reduce Formal Documentation and Briefings (Emphasis on Defense Enterprise Programs (DEP))	OUSD(A)/PI/Comm. Chrmn.
-Replace Working Groups with Informal OSD/Service Interaction	Comm. Chrmn/Services

Panel 1 - Session B-Metrication--Your Role Now!

Recommendations:	Responsible Office
Review and revise DOD-STD-1476 as needed to ensure compliance with DoDD 4120.18.	OASD(P&L)DPSO
Develop a plan for transitioning the construction industry to metric standards in coordination with that industry.	OASD(P&L)DPSO

Panel 2 -Session A-NDI--Is the DoD Really Serious?

Recommendation:
Emphasize the NDI Program and bring it to the "working level." — OASD(P&L)SDM
The definition of NDI needs to be more widely promulgated. Actions recommended to promote the program are:

1. Promulgate a provision allowing commercial market acceptability to be a requirement in technical documents.
2. Focus on implementation instead of new policy.
3. Emphasize best value instead of best price.
4. Share success stories.
5. Eliminate confusing contract clauses.

Panel 2-Session B--Total Quality Management

Recommendations:
Establish Total Quality Management (TQM) as a way of life in DoD. — OASD(P&L)IPQ

Have all DoD personnel directly doing continuous process improvement.

Implement widespread defense industry continuous process improvement .

Obtain Congressional understanding of and support for TQM.

Eliminate barriers to TQM implementation.

Harmonize DoD Directives/Regulations/Instructions and TQM.

Implement commitment by major defense contractors.

Develop, produce, acquire, and promulgate a standard set of TQM training materials.

Coordinate the DoD TQM effort with other sectors of the Federal Government.

Establish DoD Executive Steering Committees (2)

Develop and implement the TQM training strategy.

Panel 3-Session A--Parts Control

Recommendations:

Adjust parts submittal time schedule. A review will be made and adjustments considered to the requirement for the submission of parts evaluation 30 days after award of contract. A suggestion was made that the time schedule coincide with the system/equipment contract milestones, e.g. commensurate with critical design review.	Preparing Activity of MIL-STD-965. Air Force
Reduce part evaluation/approval time. The use of automation and electronic data and electronic data submittal should improve on part evaluation/approval time.	DLA and Service Military Parts Control Advisory Groups
Expand the Standardized Military Drawing Program. Currently, the SDMP is approved for use only in the microcircuit area. Numerous requests have been made to expand the coverage to include other electronic classes.	OASD(P&L)DPSO
Provide feedback on field failure data. Equipment designers and the MPCAGs need field failure data to improve the reliability and quality of systems and equipments deployed to the troops. A DoD wide program is being established through the Joint Logistics Commander group. A letter will be sent to Dr. Costello from the senior members of the JLCs requesting his support and endorsement	Military Services' Reliability Offices
Provide program unique requirements to MPCAGs. Program managers must provide program unique requirements to the MPCAGs so that a more accurate part evaluation service can be provided.	Military Services' Contracting Offices
Implement the DoD IG recommendations. The recent DoD IG audit resulted in several constructive recommendations. We must assure that the recommendations are implemented.	OASD(P&L)DPSO, Army, Navy, Air Force, DLA

Panel 3-Session B--Rights in Technical Data--Issues and Controversies

Recommendation: Investigate the feasibility of adding the limited rights legend requirements in the proposed draft MIL-Standard for distribution and marking statements.	OASD(P&L)DDMO

Panel 4-Session A--International Standardization (RSI)

Recommendations: Increase DoD/Industry technical expert participation in national standardization committees that support ISO and IEC.	OASD(P&L)DPSO/ Industry
Establish standard to provide uniform national certification qualification systems for products and manufacturers.	OASD(P&L)DPSO/ Industry
Improve the national procedures for implementation of reciprocal multinational product qualification/certification.	OASD(P&L)DPSO/ NATO AC/301
Develop a NATO list of preferred materials for use in defense systems intended for multinational use.	OASD(P&L)DPSO/ Services/NATO AC/301
Improve availability and distribution of information on DoD use of ISO, IEC, NATO, ABCA, and other international standardization documents.	OASD(P&L)DPSO/ Services
Develop international interface standards for interchangeability of materials, parts, and components produced by NATO national industries.	OASD(P&L)DPSO/ Services/NATO AC/301, AC/82
Develop catalogue on interchangeable materials, parts, and components used in U. S., CA, and other alliance nations.	DoD
Encourage use of common standards at the regional level.	DoD/Industry/NATO
Direct more attention to developing operational standards to improve alliance forces interoperability.	Services/SDM/NATO/ MAS, IMS
Develop automated information bases for international standards under development and available for use.	SDM/JCS/NATO AC/315
Issue instruction to prevent use of international standards which have not been approved by the appropriate technical committee and policy officials.	OASD(P&L)DPSO/ SDM/OSD
Determine and report mission-essential data concerning standardization projects for NATO for use in justifying adequate operation budget support by military commands and DoD agencies.	OSD/SDM/Services/ NATO AC/315

Panel 4 B-Session B--Streamlined Specifications--Generation and Application

No firm recommendations

1988

DoD STANDARDIZATION AND DATA MANAGEMENT CONFERENCE

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